

MULLANEY ENGINEERING, INC.

9049 SHADY GROVE COURT
GAITHERSBURG, MD 20877

ENGINEERING EXHIBIT EE-1:

**RADIO STATION KRCY (FM)
HUALAPAI BROADCASTERS, INC.
DOLAN SPRINGS, ARIZONA**

Ch. 224C 100 KW 541 M HAAT

SEPTEMBER 10, 2001

**ENGINEERING STATEMENT IN SUPPORT OF
AN APPLICATION FOR A
CHANGE OF SITE & CHANGE OF CITY OF LICENSE
PER MM DOCKET 01-63**

File No. BMLH-20010514AAF - Facility ID: 27982

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- Existing Tower, Topo Not Required.

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 Hualapai Broadcasters, Inc., to prepare the instant engineering exhibit in support of an application for Construction Permit for a change of site and change in city of license per MM Docket 01-63 to Dolan Springs, Arizona (FCC Facility ID Number: 27982).

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 10th day of September 2001.

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Ch. 224C 100 KW 541 M HAAT

NARRATIVE STATEMENT:

I. General:

This engineering statement has been prepared on behalf of Hualapai Broadcasters, Inc., licensee of KRCY (FM) at Kingman, Arizona. The purpose of this statement is to request a Construction Permit authorizing a change of site and change in city of license per MM Docket 01-63 to Dolan Springs, Arizona. KRCY will operate with an ERP of 100 KW and an HAAT of 541 Meters. This application proposes facilities which are in compliance with the contour protection requirements of Section 73.215.

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. Since the proposed facility contributes less than 5% of the "controlled" standard it is **categorically excluded** from further consideration.

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

II. Engineering Discussion:

A. Proposed Location:

KRCY proposes to locate on an existing tower which has recently been erected at Dolan Springs, Arizona. The Antenna Structure Registration (ASR) number is 1211383. Since an existing tower will be used a topographic map showing the proposed site is not required. The NAD-27 geographic coordinates are:

Latitude: 35° 39' 07"

Longitude: 114° 18' 42"

The city of license, Dolan Springs, Arizona, is located approximately 7 kilometers southeast of the proposed site. The Regional Office of the FAA was not notified of this proposal since the tower already exists.

B. Antenna System and Tower:

A dual polarized ERI 8-bay FM antenna will be side mounted near the top of a existing tower. Figure 3 is a sketch of the tower. The antenna has a non-directional power gain of 4.487 H/V.

The antenna will be fed by 335 Meters (1100 Feet) of 4" coaxial cable, with a rated efficiency of 75.9 percent for this length..

C. Transmitter:

KRCY plans to install a type accepted 35 KW FM transmitter. The transmitter will be operated at 29.4 KW which is within its rated power.

D. Effective Radiated Power:

Giving consideration for the maximum antenna gain, transmitter power and line loss, the maximum Effective Radiated Power is 100 KW for the Horizontal and 100 KW for the Vertical Component.

E. Channel Allocation:

Figure 4 is a channel allocation study from the proposed site. The proposed site is short spaced under the rules to one station, KXFF on Ch. 223C at Cedar City, Utah. It should be noted that the proposed site appears to be short spaced to KJJJ on Ch. 224C2 at Lake Havasu, AZ. However, KJJJ has already moved to Ch. 272C2 per MM Docket 99-271. In all other respects this application is in compliance with Section 73.207(a).

1. Contour Protection - Section 73.215:

Figure 5 is a map of the protected 60 dBu and the first adjacent interfering 54 dBu contour proposed by this application. In addition, the map shows the same protected & interfering contours for KXFF except that they are based upon **maximum permissible** ERP and HAAT for a Class C station.

As can be seen, no prohibited overlap occurs. All contours are based upon terrain radials spaced every 5 degrees.

F. 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 Figure 2 of 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.

Figure 2-A is a tabulation of the distances to the 70 dBu (3.16 mV/M - City Grade) & 60 dBu (1.0 mV/M - Primary) contours in Metric Units (Meters/Kilometers).

G. Terrain Profile to City of License:

The N-150-E radial is the direct path to the City of License. From the proposed site the 3.16 mV/M City Grade Contour will completely encompass the City of License without major terrain obstruction.

H. 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 1990 census.

I. FM Blanketing Contour:

KRCY 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 (see Figure 2-A) and is in a sparsely populated area. Given the height of the proposed antenna, no problems are anticipated.

J. Other Services in Area:

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

This is the existing site or proposed site of two other FM stations and miscellaneous other communication facilities. Besides what exists on the tower there are no other known transmission facilities within 60 meters (197 feet) of the proposed antenna.

There are 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, KRCY will investigate and correct such cases in accordance with the Commission's Rules.

K. Environmental Assessment Statement:

KRCY 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. Since an existing tower will be used with no change in overall height the only remaining environmental issue is R.F. Exposure. Specifically the proposed facility:

1) 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	$900/(\text{Freq}^2)$
30 to 300	1.0 VHF TV & FM
300 to 1,500	$\text{Freq}/300$ UHF TV
1500 to 100,000	5.0

KRCY 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 are or will be three 100 kW FM facilities.** However, as will be shown, the contribution from KRCY is below the 5% threshold and, thus, KRCY is categorically excluded from having to conduct a full evaluation.

FM Broadcast Stations

For FM Broadcast Stations the following formula is used:

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

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/cm²
- 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 92.7 MHz and an “un-controlled” Power Density of 0.2 milli-watts results in a minimum distance of 182.9 meters (599 feet) from the antenna.

Figure 6 is a vertical elevation plot for an ERI 8 bay full-wave spaced FM antenna (SHP-8AC).

Figure 6-A is a plot of the predicted RF Exposure at 7 feet above ground level. The “solid” line assumes a vertical form factor of F=1.0 while the

“dashed” line uses the vertical form factor from Figure 6. As can be seen, the use of the 8 bay ERI FM antenna reduced the exposure at ground level below 4 uW/sq.cm or 0.4 percent of the standard for a “controlled” area. For FM, the “un-controlled” standard is 20% and therefore, this proposal is in full compliance and is **categorically excluded** from further consideration since it is less than 5%.

The tower is 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, KRCY 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.]In the instance of a multiple use site, a single site access policy incorporating the above philosophy will be established. All procedures will be reviewed & updated as necessary.

III. SUMMARY:

Hualapai Broadcasters, Inc., licensee of Radio Station KRCY (FM) requests a construction permit authorizing a change of site and change in city of license per MM Docket 01-63 to Dolan Springs, Arizona. KRCY will continue to operate on Channel 224C. This application proposes contour protection per 73.215 to one FM station. This engineering proposal is in full compliance with the Commission's Rules.

/s/ John J. Mullaney

John J. Mullaney, Consulting Engineer

September 10, 2001.