

**RESPONSE TO INQUIRIES  
GRAY TELEVISION LICENSEE, LLC  
KNCT, BELTON, TX  
REGARDING MSW LAND MOBILE STUDY DATED DECEMBER 21, 2018**

**INTRODUCTION and BACKGROUND**

This is in response to two verbal requests raised by the FCC regarding certain parameters that were utilized in a Land Mobile study conducted by Meintel, Sgrignoli and Wallace ("MSW") dated December 21, 2018. The study focused on the impact that KNCT's proposed channel 17 facility, LMS File Number 0000064448, would potentially have on Land Mobile operations operating on TV channel 16 in the Dallas, Texas area. As background, KNCT currently operates on TV channel 46 but was assigned channel 17 as part of the FCC's Incentive auction program.

The two requests concern the parameters used in the study for antenna cross-polarization discrimination and calculating Land Mobile ("LM") desensitization. MSW submits the following responses to the requests made by the FCC.

**1. UTILIZATION OF LM ANTENNA CROSS POLARIZATION DISCRIMINATION ("XPD")**

*FCC Request: The FCC states that previous LM studies submitted by MSW for other stations did not use XPD. A statement is requested to support why 3 dB of XPD was used in the KNCT study.*

*MSW Response:* Some MSW studies conducted for other stations have indeed not considered XPD. There are, however, some studies that did. The consideration of XPD for the KNCT study is now no longer a concern as explained in the following paragraph.

Since the original December report was submitted the station has now selected the make and model of the transmitter they intend to use. This was not known at the time of the initial study. The December report considered the minimum performance typical of tube-type transmitters having pre-filter out-of-band emission of -47 dB at the band edge. Modern solid state transmitters have a pre-filter out-of-band emission response that is typically 10 to 15 dB better than tube type transmitters. A revised KNCT study has been performed using the intended Rohde & Schwarz transmitter pre-filter response in lieu of the default flat -47 dB lower side band response used in the initial MSW study. In the revised study the XPD value was set to 0 dB and, therefore, not considered.

**2. LM RECEIVER DESENSITIZATION**

*FCC Request: Provide a statement to support the use of 80 dB for LM receiver desensitization protection*

*MSW Response:* Section 47 C.F.R. § 73.687(e)(4)(ii) of the Rules gives a value that is to be used to protect Land Mobile stations from out-of-band-emissions. In that same section the protection of LM receivers from desensitization ("overload") is also referred to. Unlike interference, where a defined value is established in that section, the desensitization parameter is not defined. Radio desensitization characteristics may vary based on the frequency separation of the desired LM channel from the undesired higher power station. Desensitization is also

dependent on the front end architecture (e.g. use of pre-filtering and pre-amplifiers) of the LM radio as designed by the manufacturer.

With no defined value given in the FCC rule section cited above, MSW based its use of the 80 dB desensitization value on a document published by Motorola, a major provider of LM radio equipment to commercial and Public Safety organizations. In that document, "Motorola's Interference Technical Appendix", Issue 1.41, dated February 2002, Section 5 discusses receiver desensitization. The term Adjacent Channel Rejection Ratio (ACRR) is used in this section to describe desensitization. The following is stated in this section, "...receivers will typically have  $\geq 90$  dB rejection of signals that are offset  $\geq 500$  kHz from the desired channel. Receivers usually will have  $\geq 80$  dB rejection for offsets exceeding approximately 50 kHz." MSW used 80 dB across the entire 6 MHz adjacent channel in this study to be conservative. At 80 dB nearly all cases were free of overload by a margin of at least 20 dB. The worst case margin was 17.5 dB (Table 7 of the revised report).

### **SUMMARY**

MSW has presented its responses to the two verbal requests made by the FCC concerning certain parameters that were used in a Land Mobile study for KNCT dated December 21, 2018. The parameters concerned the use of receive antenna cross-polarization and the source of the 80 dB receiver desensitization value.

MSW has performed a revised study that includes the transmitter pre-filter response plus the response of an 8-section filter. Adding the actual transmitter pre-filter response provides adequate margin to where cross-polarization was not utilized in the revised study and, therefore, is no longer a concern.

The reference for the 80 dB value used for LM receiver desensitization was identified as coming from an Interference Technical Appendix published by Motorola.

A copy of the revised KNCT LM study has been provided as part of this response. Similar to the previous study, no cases of out-of-band-emission interference or receiver desensitization were found.

MSW stands ready to answer any further questions regarding the responses given herein.

Prepared by,



Joseph L. Snelson, Jr. CPBE  
Email: [joe.snelson@mswdtv.com](mailto:joe.snelson@mswdtv.com)  
Phone: 702-610-9081  
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