

May 8, 2017

Mr. Shaun Maher
Video Division
Media Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

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Federal Communications Commission
Bureau / Office

Re: Station KCEC(TV)
Denver, Colorado
FIN: 24514

Dear Mr. Maher:

We write to you, on behalf of our client, Entravision Holdings, LLC (“Entravision”), the licensee of Station KCEC(TV), Denver, Colorado, following a recent meeting between Mr. Manuel Cavazos III, Entravision’s Senior Vice President and Director of Technology, and Mr. Jeffrey Neumann, the Media Bureau’s Chief Engineer. Mr. Neumann suggested that Entravision present to you, in your capacity as the Bureau’s Transition Coordinator for Denver, Colorado, its concerns arising from the channel reassignment recently made to KCEC.

As described in the channel reassignment letter, issued on February 8, 2017, and in subsequent Commission actions involving post-auction channel reassignments, KCEC is being involuntarily reassigned from Channel 26 to Channel 14. As you are aware, Channel 14, which utilizes the 470-476 MHz spectrum, lies immediately adjacent to land mobile (“LM”) operations in the 460-470 MHz band.¹ Pursuant to Section 73.623(e), digital broadcast television stations are not customarily allotted in Channels 14-20, absent applicable distance separation between digital stations and LM operations.

Entravision was surprised by the Commission’s assignment of Channel 14 to KCEC, considering the potential for harmful inference to LM operations in the 460-470 MHz band. In order to determine if there would be interference issues affecting the Channel 14 allotment, Entravision commissioned the communications engineering consulting firm of du Treil, Lundin & Rackley, Inc. (“DLR”) to analyze the potential operation of KCEC on that channel.

¹ See Section 2.106 for assignment of fixed land mobile and land mobile services to 460-470 MHz band.

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The attached Initial Report, prepared by DLR, presents the results of an analysis as to the impact of operations on Channel 14 in the Denver television market on local LM operations. As described by the consultants there can be expected to be interference to LM stations, including that of Station WPPC331, which is the closest LM facility to the existing and proposed transmitter site used by KCEC. In order to deal with such interference Entravision would have to engage in mitigation efforts to prevent any actual or passive intermodulation. However, as DLR discusses, high cost mitigation efforts, including filtering, have not generally been proven successful in protecting LM facilities from harmful interference by Channel 14 licensees.

More importantly, the use of filtering is not an option for KCEC. Entravision has reviewed the available facilities at the Lookout Mountain antenna farm where Entravision is a licensee of a third-party's transmission facilities. The transmitter building cannot house a bandpass filter and it is not likely that the building could be expanded or a new one constructed, owing to the strong local opposition to facilities construction on Lookout Mountain.²

In the absence of interference protections that a broadcast station can employ successfully, it would be left to the LM industry to deal with desensitization and intermodulation effects. DLR was unable to determine how much time and expense would be involved in such efforts. More importantly, they are unable to conclude that a combination of KCEC filtering, if possible owing to the Lookout Mountain situation, and LM receiver desensitization and intermodulation mitigation, through filtering, will work as a means for preventing LM interference. Further, it does not appear that these unique efforts would be reimbursable by the Commission through the TV Broadcaster Relocation Fund (the "Fund") and the Catalog of Reimbursement Expenses. The *Public Notice*, Incentive Auction Task Force and Media Bureau Finalize Catalog of Reimbursement Expenses, 32 FCC Rcd 1199 (IATF and MB 2017), that details applicable reimbursable expense, does not provide for LM licensees to secure compensation where a Channel 14 assignment causes harmful interference to them.

Considering this, Entravision urges the Commission to recognize the unusual circumstances applicable to this Channel 14 allotment that it has made and to take appropriate responsive

² The Commission may want to review the record of local opposition to construction of facilities on Lookout Mountain, which nearly prevented the DTV transition in the Denver television market. It took an act of Congress to resolve the controversy, involving legislation stating that any person that holds an approved FCC DTV construction permit for a tower located on Lookout Mountain could construct its tower if such tower was "of the same height or lower than the tallest existing analog broadcast antenna or tower at such location." See Pub. L. No. 109-466 (2006). Entravision submits that the Commission would not want to rely on Congressional intervention once again to resolve a Lookout Mountain problem.

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actions. One option is to change KCEC's reassignment to a different channel, where there would be no effect on LM operations in Denver. Entravision's consulting engineers have undertaken a review and cannot, on their own, locate an alternate channel that would allow for replication of KCEC's pre-auction coverage. Perhaps, the Commission, which has undertaken the work to make the channel reassignments and has a comprehensive database and software to work with, can locate a channel that would resolve this issue and Entravision is prepared to give such channel due consideration.

Assuming that a different channel cannot be found, Entravision requests that the Commission recognize that while there will be an impact on LM operations, KCEC should not be responsible for mitigating LM interference owing to the unique circumstances of the repacking process and its operations on Lookout Mountain. Such recognition should be evidencing by the Commission not placing any LM interference mitigation requirement in the construction permit awarded to KCEC in the post-auction channel application process for reassigned stations³ and, instead, including an affirmative condition that KCEC has no interference remediation obligations to LM operations should they arise.

LM licensees that are affected by interference must be required to accept the interference or resolve it by their own channel change or filtering that deals with desensitization and intermodulation effects. In order to ameliorate this potential problem, the Commission should also give due consideration to expanding its reimbursable expenses policy to include a Channel 14 permittee's right to retain the services of a third-party engineering firm to contact LM licensees and work with them to take actions necessary to protect their operations from interference by the reassigned station, including the installation of filtering equipment paid for by the Fund.

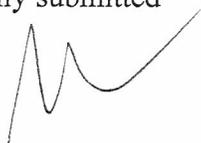
Entravision submits that the involuntary assignment of a station to Channel 14 by the Commission, where there exists the possibility of LM interference, should not place extraordinary obligations upon such a station to resolve interference to adjacent LM licensees. This can be avoided by not requiring a licensee of a new Channel 14 station, such as Entravision, to resolve LM interference complaints and should, instead, involve the Commission reaching a determination that it is necessary to protect affected LM stations through use of the Fund. As for Channel 14 licensees, their sole obligation should be to alert local adjacent frequency LM stations of the potential problem and to advise them to work with their engineering advisers and the Fund to ameliorate such potential interference impacts.

³ *Public Notice*, Incentive Auction Task Force and Media Bureau Announce Procedures for the Post-Incentive Auction Broadcast Transition, 32 FCC 2d 858, 864-865 (IATF and MB 2017).

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Should there be any questions in regard hereto, please communicate with the undersigned.

Respectfully submitted



Barry A. Friedman

Enclosure

cc: Mr. Jeffrey Neumann
Mr. Hossein Hashemzadeh
Ms. Jean L. Kiddoo

INITIAL REPORT ON
LAND MOBILE INTERFERENCE ANALYSIS
TELEVISION STATION KCEC(TV)
DENVER, COLORADO
CHANNEL 14 414 KW (MAX-DA) 244 M
(REPACK REASSIGNMENT)

This report was prepared on behalf of television station KCEC(TV), Denver, Colorado, in regard to its given FCC Incentive Auction Repack Assignment on Channel 14. KCEC is licensed for operation on Channel 26 and it operates with a maximum directional effective radiated power (ERP) of 549.5 kW with an antenna height above average terrain of 244 m. According to the information provided to the licensee by the FCC, KCEC will be given a repack reassignment on Channel 14 with a maximum directional ERP of 414 kW with no other changes to the facility.

Channel 14 is immediately adjacent to the 460-470 MHz land mobile (LM) band. This band employs frequency division duplex with the upper 5 MHz segment being designated for mobile transmitting/base station receive. This statement provides the results of an interference analysis regarding LM facilities, and the LM base stations in particular, that are authorized for operation in the adjacent LM band. The analysis is based on the FCC's master frequency database.

The LM interference analysis results can be employed to determine the sharp-tuned filter requirements necessary to provide the required protection to LM services in the 460-470 MHz band.

In addition, this report provides the results of an initial receiver desensitization analysis with respect to a selected nearby land mobile system of concern. Comments on this and other potential issues are provided herein.

Protection of Land Mobile Facilities

An analysis was conducted of all LM facilities in the 460-470 MHz LM band that could be affected by the proposed Channel 14 facility. All LM facilities within 100 km of the transmitter site and in the band segment from 465-470 MHz were examined. This analysis encompassed over 3,700 LM records. The attached tabulation is a summary of the interference analysis.

A sample calculation of the interference analysis with respect to LM facility WPPC331 on 469.4375 MHz is summarized below:

Parameter	Value
Frequency	469.4375 MHz
Ch. 14 Average EIRP (ERPdipole=414 kW)	+88.3 dBm
DTV mask filter requirement at frequency [73.622(h)]	47.9 dB
Filter attenuation*	0.0 dB
Transmitting antenna discrimination†	0.0 dB
DTV coupling into LM (30 kHz assumed LM bandwidth)‡	12.2 dB
Cross-polarization discrimination§	20.0 dB
Free-space path loss to receive antenna at frequency (0.056 km)**	60.9 dB
LM antenna gain	11 dBi
LM line loss	2.0 dB
Received DTV interference power	-43.7 dBm

* No additional filtering above standard FCC mask assumed for this initial study.

† The conservative assumptions of a non-directional azimuthal pattern and no elevation pattern discrimination were assumed for initial study purposes.

‡ This figure is conservative since most LM facilities in this band will operate with a 12.5 kHz bandwidth.

§ The Channel 14 facility is assumed to operate with horizontal-only polarization.

** Based on license information, the WPPC331 antenna is located only 56 meters away from the KCEC transmitting antenna and it would be at nearly the same elevation above mean sea level.

Parameter	Value
Equivalent field strength per Section 73.687(e)(4)(ii)	86.9 dBuV/m
FCC interference criteria per Section 73.687(e)(4)(ii)	17 dBuV/m
Margin to interference per Section 73.687(e)(4)(ii) ^{††}	-79.9 dB
Analysis result ^{††}	Additional filtering required.

This analysis is based on the 17 dBuV/m interference field strength criteria outlined in Section 73.687(e)(4)(ii) of the FCC Rules. As indicated above, the margin to interference relative to the 17 dBuV/m criteria is -79.9 dB. Therefore, the Channel-14 facility would require additional filtering of at least 79.9 dB below the normal FCC mask filter to meet the FCC's 17-dBuV/m required field strength protection requirement. See tabulated results for all of the LM facilities within the given search distance. Also attached is graph showing the calculated protection requirements with reference to the normal FCC emission mask requirement for full-service DTV stations.

This study assumes that the proposed transmitting antenna for the Channel 14 television station is horizontally-polarized-only. A horizontally-polarized-only transmitting antenna is needed to provide the highest level of isolation possible with respect to the adjacent land mobile facilities.

Land Mobile Receiver Desensitization Potential

With respect to the potential for LM receiver desensitization and intermodulation interference, a general analysis was prepared considering the closest LM facility to the KCEC transmitter site, which is WPPC331, located at distance of approximately 56 m west-northwest from the KCEC antenna tower site. The

^{††} This includes an additional 10 dB safety margin.

^{††} This result indicates that at least 27.6 dB of additional suppression beyond the required 47.0 dB mask limit is necessary at 469.8 MHz to ensure protection of the WPLR609 base station receiver.

desensitization analysis with respect to WPPC331 is summarized as follows:

Parameter	Value
Frequency	470 MHz
Ch. 14 Average EIRP (ERP _{dipole} =414 kW)	+88.3 dBm
Transmitting antenna elevation pattern discrimination	0.0 dB
DTV coupling into LM (12.5 kHz LM bandwidth)	-26.3 dB
Cross-polarization discrimination	20.0 dB
Free-space path loss to receive antenna at frequency	60.8 dB
Receiving antenna elevation pattern discrimination	0.0 dB
LM antenna gain	+11.0 dBi
LM line loss	2.0 dB
LM receiver out of band rejection	80.0 dB
Received DTV interference power	-89.8 dBm
Estimated LM receiver noise floor	-116 dBm
Margin to desensitization/intermodulation interference	-26.2 dB
Analysis result	Interference Potential

Based on the above, LM receiver desensitization or intermodulation interference is predicted based on typical system parameters. The potential for these effects diminish rapidly with distance. It appears that all licenses within approximately 1,500 meters could be subject to receiver desensitization or intermodulation effects based on typical parameters. Copies of all potentially affected LM licenses within 1,500 meters are included herein.

It may be necessary to work with each individual licensee to determine the type of equipment in use at the affected locations. In addition, it may be necessary to install additional filtering on the land mobile facility side to meet protection requirements. It is not possible to predict the requirements reliably without very detailed

information about each license. An even then, a case-by-case evaluation may be necessary after the KCEC Channel 14 installation is completed.

Potential for Unresolvable Interference to Land Mobile

There is at least one known and ongoing case of unresolved interference into LM facilities from a Channel 14 digital television facility. This is a case involving Channel-14 station, KTNC-TV, Concord, California. See attached database information sheet on the KTNC-TV, for its long pending Application for License.

In that case, KTNC-TV installed a sharp-tuned filter on its transmission system to protect nearby land mobile facilities operating in the 460-470 MHz band. But despite all efforts, which have continued for at least eight years, the case was never resolved. Due to ongoing interference, it has been necessary for KTNC-TV to operate at reduced power indefinitely.

The latest known status report on the KTNC-TV situation that was filed with the FCC is attached hereto. The details of the various forms of mitigations attempted are explained. It is pointed out that EXTERNAL factors, such as passive intermodulation, appear to be one of the sources of interference to LM facilities. Efforts to eliminate passive intermodulation appear to have been unsuccessful despite expenditures of over \$500,000.00 to mitigate these effects and maximize the protection to LM facilities.

In view of this case, and given that the KCEC transmitter site is located on Lookout Mountain, which the location of numerous broadcast and non-broadcast transmission facilities, it is possible that the KCEC case could be similar to the KTNC-TV case; and could result in unresolvable interference to land mobile facilities.

Former Channel 14 Operation in Denver, CO Market

A review of the FCC's historical records indicates that there was formerly an analog Channel 14 full-service television station located in the Denver market. This station was KTFD-TV, Boulder, Colorado. An FCC engineering database summary sheet of the former KTFD-TV analog Channel 14 facility is attached hereto.

Also attached hereto is the last Application for License by KTFD-TV that addressed the adjacent land mobile issue. Therein it was stated that the facility employed a 13-stage constant impedance waveguide bandpass filter followed by waveguide cavity notch filters to achieve protection of LM facilities.

The KTFD-TV case is distinguished from the instant KCEC case due to the fact that the KTFD-TV Channel-14 transmitter site was located approximately 7 km south of Lookout Mountain. A study of all LM records, including expired LM records, in the near vicinity of the former KTFD-TV Channel 14 location indicates that the closest LM facilities from the KTFD-TV facility were no closer than 2.8 km from the KTFD-TV transmitter site. Therefore, there was much less potential for LM receiver desensitization and greater potential for interference resolution with sharp-tuned filtering on the KTFD-TV facility. But even so, a very high-suppression 13-stage bandpass filter with notches was needed to meet the LM protection requirements.

Conclusion

Based on the foregoing, the sharp-tuned filter requirements for protection of LM facilities from the proposed KCEC Channel 14 reassignment facility were determined.

It was determined that there is the potential for LM receiver desensitization and intermodulation effects from the KCEC facility for LM facilities

located within approximately 1.5 km of the KCEC transmitter site. Just filtering on the KCEC transmitting facility will NOT solve the LM receiver desensitization issue. Additional filtering may be necessary on LM facilities at UNKNOWN expense and effort.

A review of the ongoing KTNC-TV case in the San Francisco, California market provides evidence that the LM interference from the KCEC facility on Channel-14 could be unresolvable. This is due to the fact that Lookout Mountain is a multi-use broadcast and non-broadcast transmitter site with LM facilities in very close proximity to the KCEC transmitter site.

Installation of sharp-tuned filtering on the KCEC facility is not a guarantee of resolution of LM interference issues. As described in the KTNC-TV case status report, unresolvable external effects can cause interference to LM despite all efforts to meet protection requirements.



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March 7, 2017