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**Engineering Statement
Minor Modification of KMEX-DT
Channel 34 at Los Angeles, CA
October 2023**

I. Background

This Engineering Statement has been prepared on behalf of KMEX License Partnership, G.P., licensee of digital television station KMEX-DT at Los Angeles, California. This application specifies a minor modification of the licensed KMEX-DT facility, to increase main lobe ERP.

II. Interference Study

Study has been made of all cochannel and adjacent-channel facilities in the vicinity of the proposed operation, including a detailed Longley-Rice interference study to demonstrate that the proposed operation will not cause interference to any authorized or pending proposed facilities. This study was performed using the Commission's *TVStudy* software.

This study was conducted using a study cell size of 1.0 km and a terrain extraction increment of 0.5 km. The "May use generic [elevation] pattern when needed" box was un-checked, so that field strength calculations would take into account the azimuth pattern, elevation pattern, and mechanical beam tilt.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations, beyond the allowed value of 0.5% to full-power and Class A stations. Based on this interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Study created: 2023.10.18 11:30:03

Study build station data: LMS TV 2023-10-16

Proposal: KMEX-DT D34 DT APP LOS ANGELES, CA
 File number: KMEX-925KW
 Facility ID: 35123
 Station data: User record
 Record ID: 1537
 Country: U.S.
 Zone: II

Search options:
 Non-U.S. records included

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
Yes	KBAK-TV	D33	DT	LIC	BAKERSFIELD, CA	BLCDT20060628ABK	144.4 km
No	KDFX-CD	D33	DC	LIC	INDIO/PALM SPRINGS, CA	BLANK0000075037	155.6
Yes	KTBN-TV	D33	DT	LIC	SANTA ANA, CA	BLANK0000197815	0.5
No	KGPE	D34	DT	LIC	FRESNO, CA	BLANK0000191060	339.1
Yes	KTAS	D34	DT	LIC	SAN LUIS OBISPO, CA	BLCDT20070222AAX	267.9
No	KABE-CD	D35	DC	LIC	BAKERSFIELD, CA	BLANK0000081347	148.0
No	KABE-CD	D35	DC	CP	BAKERSFIELD, CA	BLANK0000121376	148.0
Yes	KTLA	D35	DT	LIC	LOS ANGELES, CA	BLANK0000197158	0.1
No	XHCTTI	D33	DT	LIC	TIJUANA, BN	BLANKBPFS20160524AAY	213.7
Yes	XHBM	D34	DT	LIC	MEXICALI, BN	BLANKBPFS166094XXX	298.7
Yes	XHAS	D34	DT	LIC	TIJUANA, BN	BLANKBPFS20160302ADV	213.8

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D34
 Latitude: 34 13 36.10 N (NAD83)
 Longitude: 118 4 2.30 W
 Height AMSL: 1838.6 m
 HAAT: 949.0 m
 Peak ERP: 925 kW
 Antenna: Andrew-ATW22HS6-ETC2L-34H (ID 1002640) 0.0 deg
 Elev Pattn: Andrew-ATW22HS6-ETC2L-34H
 Tilts: elec 1.50, mech 1.50 @ 200.0 deg

40.7 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	59.8 kW	397.2 m	84.2 km
45.0	67.8	400.9	85.3
90.0	507	686.6	119.0
135.0	462	1413.0	144.2
180.0	82.3	1538.4	127.5
225.0	84.8	1490.4	126.5
270.0	382	1022.6	128.4
315.0	467	635.8	115.8

Database HAAT does not agree with computed HAAT
 Database HAAT: 949 m Computed HAAT: 948 m

ERP exceeds maximum
 ERP: 925 kW ERP maximum: 149 kW

Distance to Canadian border: 1620.4 km

**Proposal is within coordination distance of Mexican border
Distance to Mexican border: 190.4 km

Conditions at FCC monitoring station: Livermore CA
Bearing: 320.6 degrees Distance: 511.0 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 56.2 degrees Distance: 1308.3 km

Study cell size: 1.00 km
Profile point spacing: 0.50 km

Maximum new IX to full-service and Class A: 0.50%
Maximum new IX to LPTV: 2.00%

---- Below is IX received by proposal KMEX-925KW ----

Proposal receives 1.88% interference from scenario 1
No IX check failures found.

III. Facilities Proposed

The proposed operation will be on Channel 34 with a maximum lobe effective radiated power of 925 kilowatts. Operation is proposed with the existing Andrew ATW22HS6-ETC2L-34H antenna, which is installed on an existing tower at the Mount Wilson communications site, with FCC Antenna Structure Registration Number 1232157.

The attached antenna data was excerpted from the manual for KMEX-DT's Andrew ATW22HS6-ETC2L-34H antenna and represents "as-built" conditions. Even though no change in antenna is proposed, the azimuth pattern does differ from the KMEX-DT license record.

The KMEX-DT antenna employs both electrical and mechanical beam tilt. Following standard practice at the time the most recent authorization of this antenna was first sought, the azimuth pattern and data filed represented the radio horizon pattern, based on the calculated horizon depression angle at each pertinent azimuthal direction, the azimuth pattern without tilt, and the effect of mechanical tilt based on the antenna's elevation radiation pattern. This caused a "flattening" of the pattern along its radiation centerline axis as reflected in the licensed pattern (BLCDT-20121203ASI).

Use of radio horizon radiation patterns is no longer necessary, given the capabilities of the Commission's LMS database to store the elevation radiation pattern and its *TVStudy* software to calculate radiation values to study points based on azimuth pattern, elevation pattern, and mechanical tilt. Accordingly, the azimuth and elevation pattern data attached (and specified in the instant application) was not adjusted for mechanical tilt.

IV. Compliance with §73.622(f) DTV maximum power and antenna heights

Processing is requested pursuant to the provisions of §73.622(f)(5), which allows for technical facilities up to those needed to provide the same geographic coverage as the largest station within the market.

The table below demonstrates that the geographic coverage of the proposed noise limited contour will not exceed that of the largest station within the Los Angeles market.

Station	Service Area (sq km)
KMEX-DT Ch34 Los Angeles - Proposed 925 kW at 949m HAAT	44,147.9
KABC-TV Ch7 Los Angeles - Licensed 28.7 kW at 978m HAAT	52,914.2
KTLA(TV) Ch35 Los Angeles - Licensed 1000 kw at 981m HAAT	54,945.3

V. RF Exposure Calculations

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(\mu W / cm^2) = \frac{33.4 \times AdjERP(Watts)}{D^2}$$

Where: $AdjERP(Watts)$ is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Ground level power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground, using the manufacturer's elevation patterns for the elliptically-polarized Andrew ATW22HS6-ETC2L-34H antenna proposed in this application. This antenna is configured for vertically-polarized power at 20% of the horizontally-polarized power (or 925 kW horizontal and 185 kW vertical.)

Separate elevation patterns were provided for the horizontally- and vertically-polarized components from this antenna. These components have been modeled separately, and their maxima summed. Mechanical beam tilt of 1.5 degrees was applied. Based on this analysis, the maximum ground-level power density from the proposed facility is calculated to be $5.5 \mu W/cm^2$, which is 1.4% of $393 \mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 34 frequency).¹

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 500 meters from the base of the antenna support structure. Section 1.1307 of the Commission's Rules exempts applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicants proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower or rooftop, including reduction in power or discontinuance of operation before any maintenance work is

¹ As indicated on the attached study results, the h-pol component maximum is $4.4 \mu W/cm^2$ and the v-pol component maximum is $1.1 \mu W/cm^2$.

undertaken. The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.

October 18, 2023

Erik C. Swanson, P.E.

Consulting Engineer

KMEX-DT Ch34 Los Angeles (Horizontally Polarized Component)

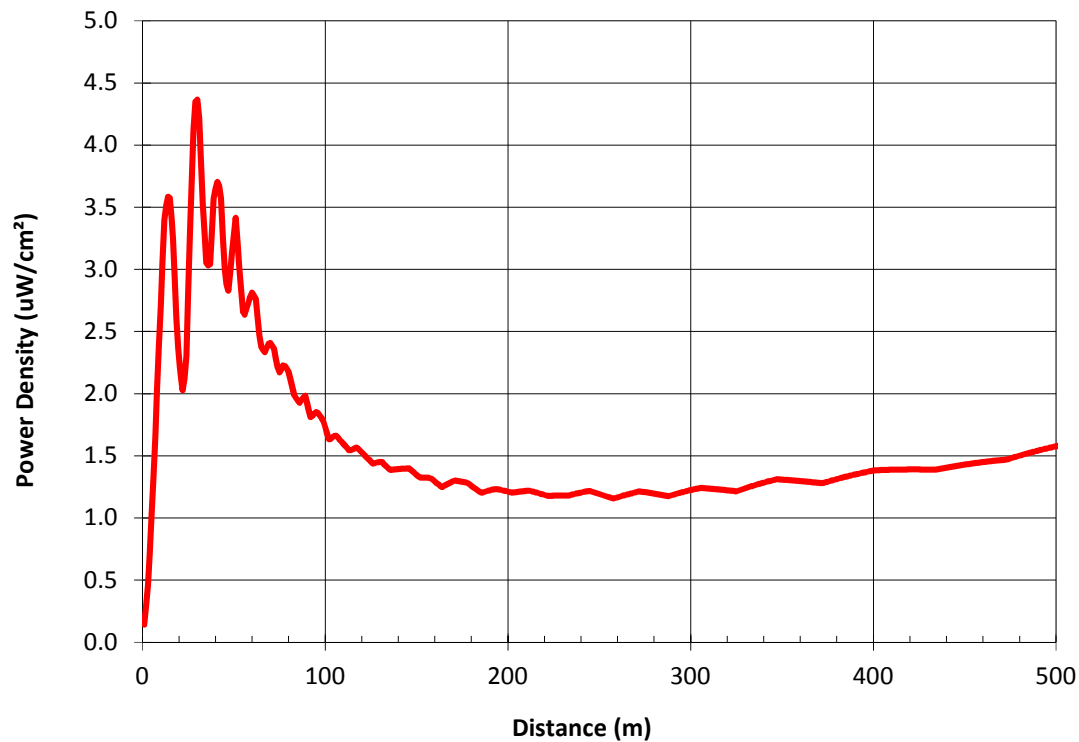
Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna	ATW22HS6-ETC2L-34H		
ERP	925,000	Watts H (avg)	
	-	Watts V (avg)	
Antenna AGL	98	meters less 2m is	96 meters above the reference plane
MBT	1.5	degrees	

Calculated
Maximum is 4.4 $\mu\text{W}/\text{cm}^2$ at 29 meters from the tower

Power Density vs Distance



KMEX-DT Ch34 Los Angeles (Vertically Polarized Component)

Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna ATW19HS6-ETC2L-34V

ERP - Watts H (avg)

185,000 Watts V (avg)

Antenna AGL 98 meters less 2m is

96 meters above the reference plane

MBT 1.5 degrees

Calculated

Maximum is 1.1 $\mu\text{W}/\text{cm}^2$ at

17 meters from the tower

Power Density vs Distance

