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**Engineering Statement
Minor Modification of KFTR-DT
Channel 29 at Ontario, CA
October 2023**

I. Background

This Engineering Statement has been prepared on behalf of Unimas Los Angeles LLC, licensee of digital television station KFTR-DT at Ontario, California. This application specifies a minor modification of the licensed KFTR-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 14:25:01

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

Proposal: KFTR-DT D29 DT APP ONTARIO, CA
 File number: KFTR-MOD
 Facility ID: 60549
 Station data: User record
 Record ID: 1538
 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	KCET	D28	DT	LIC	LOS ANGELES, CA	BLANK0000193023	0.5 km
Yes	KESQ-TV	D28	DT	LIC	PALM SPRINGS, CA	BLANK0000078362	155.6
No	KVMM-CD	D28	DC	LIC	SANTA BARBARA, CA	BLANK0000054369	150.2
No	KVMM-CD	D28	DC	CP	SANTA BARBARA, CA	BLANK0000127520	150.2
Yes	KBFX-CD	D29	DC	LIC	BAKERSFIELD, CA	BLTTA20101018ACF	144.4
Yes	KQMM-CD	D29	DC	CP	SANTA MARIA, CA	BLANK0000127506	208.3
Yes	KQMM-CD	D29	DC	LIC	SANTA MARIA, CA	BLDTL20080423AEG	208.3
No	KVCW	D29	DD	LIC	LAS VEGAS, NV	BLANK0000159469	341.4
Yes	KXLA	D30	DT	CP	RANCHO PALOS VERDES, CA	BLANK0000145233	0.0
Yes	KXLA	D30	DT	LIC	RANCHO PALOS VERDES, CA	BLANK0000081656	0.0
No	XHJK	D28	DT	LIC	TIJUANA, BN	BLANKBPFS20091104ADT	214.1
Yes	XHENB	D29	DT	LIC	ENSENADA, BN	BLANKBPFS20160301ABR	292.9
Yes	XHTIT	D29	DT	LIC	TIJUANA, BN	BLANKBPFS20091109AAC	214.1
No	LICITACIOND30		DT	LIC	TIJUANA, BN	BLANKBPFSXXXX0004XXX	214.2

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D29
 Latitude: 34 13 36.10 N (NAD83)
 Longitude: 118 4 2.30 W
 Height AMSL: 1838.6 m
 HAAT: 949.0 m
 Peak ERP: 780 kW
 Antenna: ERI-ATW22HS6-ETC1-29H (ID 1002639) 0.0 deg
 Elev Pattern: ERI-ATW22HS6-ETC1-29H
 Tilts: elec 1.50, mech 1.00 @ 200.0 deg

40.2 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	195 kW	397.2 m	93.3 km
45.0	72.2	400.9	86.4
90.0	531	686.6	120.5
135.0	404	1413.0	143.8
180.0	191	1538.4	138.1
225.0	174	1490.4	135.9
270.0	416	1022.6	130.5
315.0	382	635.8	114.9

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

ERP exceeds maximum

ERP: 780 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 KFTR-MOD ----

Proposal receives 2.00% interference from scenario 1

Proposal receives 1.96% interference from scenario 2

Proposal receives 2.00% interference from scenario 3

Proposal receives 1.96% interference from scenario 4

Proposal receives 2.00% interference from scenario 5

Proposal receives 1.96% interference from scenario 6

Proposal receives 2.00% interference from scenario 7

Proposal receives 1.96% interference from scenario 8

No IX check failures found.

III. Facilities Proposed

The proposed operation will be on Channel 29 with a maximum lobe effective radiated power of 780 kilowatts. Operation is proposed with the existing ERI ATW22HS6-ETC1-29H 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 KFTR-DT's ERI ATW22HS6-ETC1-29H antenna and represents "as-built" conditions. Even though no change in antenna is proposed, the azimuth pattern does differ from the KFTR-DT license record.

The KFTR-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-20120100401AFY).

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)
KFTR-DT Ch29 Ontario - Proposed 780 kW at 948m HAAT	46,416.8
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 ERI ATW22HS6-ETC1-29H antenna proposed in this application. This antenna is configured for vertically-polarized power at 20% of the horizontally-polarized power (or 780 kW horizontal and 156 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 1.0 degrees was applied. Based on this analysis, the maximum ground-level power density from the proposed facility is calculated to be 12.3 $\mu W/cm^2$, which is 3.3% of 373 $\mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 29 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

¹ As indicated on the attached study results, the h-pol component maximum is 9.8 $\mu W/cm^2$ and the v-pol component maximum is 2.5 $\mu W/cm^2$.

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 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

KFTR-DT Ch29 Ontario (Horizontally Polarized Component)

Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna ATW22HS6-ETC1-29H

ERP 780,000 Watts H (avg)

- Watts V (avg)

Antenna AGL 98 meters less 2m is

96 meters above the reference plane

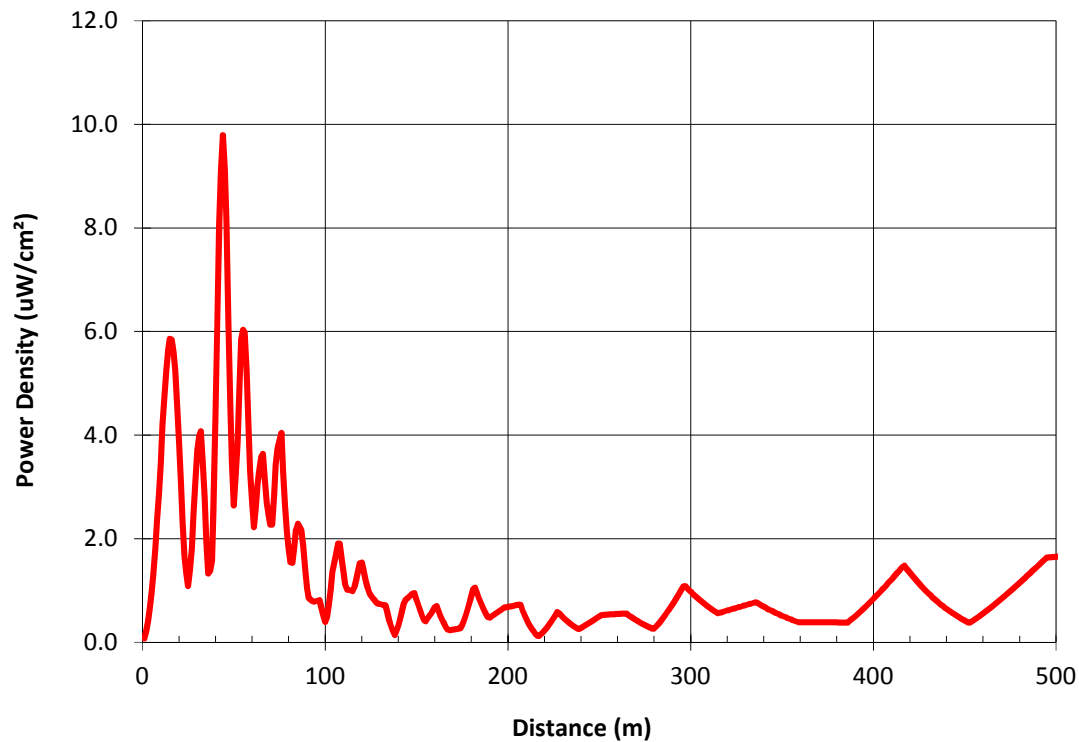
MBT 1 degrees

Calculated

Maximum is 9.8 $\mu\text{W}/\text{cm}^2$ at

43 meters from the tower

Power Density vs Distance



KFTR-DT Ch29 Ontario (Vertically Polarized Component)

Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna ATW22HS6-ETC1-29V

ERP - Watts H (avg)

156,000 Watts V (avg)

Antenna AGL 98 meters less 2m is

96 meters above the reference plane

MBT 1 degrees

Calculated

Maximum is 2.5 $\mu\text{W}/\text{cm}^2$ at

99 meters from the tower

Power Density vs Distance

