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**Engineering Statement
Application for
CP Modification for KBTU-LD
Channel 15 at Salt Lake City, UT
May 2021**

I. Background

This Engineering Statement has been prepared on behalf of DTV America Corporation ("DTVA"), the licensee of low power digital station KBTU-LD at Salt Lake City, Utah. This material has been prepared in connection with an application for minor modification of construction permit.

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.

The results of this study indicate that the proposed facility is predicted to cause zero additional interference to any of the listed stations. Based on the foregoing interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Study created: 2021.05.06 15:51:32

Study build station data: LMS TV 2021-04-30

Proposal: KBTU-LD D15+ LD APP SALT LAKE CITY, UT
File number: KBTU-CPMOD
Facility ID: 125589
Station data: User record
Record ID: 1243
Country: U.S.

Build options:
Protect pre-transition records not on baseline channel

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	K14RY-D	D14	LD	LIC	MALAD & SURROUNDING, ID	BLANK0000074790	155.4 km
No	K14OA-D	D14	LD	LIC	PRESTON, ID	BLD TT20111005AJC	164.3
No	K14RT-D	D14	LD	LIC	FRUITLAND, UT	BLANK0000095185	122.7
No	K14RM-D	D14	LD	LIC	LAKETOWN, ETC., UT	BLANK0000093599	154.6
No	K14RP-D	D14	LD	LIC	LEAMINGTON, UT	BLANK0000125318	128.2
No	K14RJ-D	D14	LD	LIC	MAYFIELD, UT	BLANK0000067147	179.4
No	K14QZ-D	D14	LD	LIC	MOUNT PLEASANT, UT	BLANK0000074564	144.7
No	K14LW-D	D14	LD	LIC	MYTON, UT	BLD TT20100120ABS	124.7
No	K19IF-D	D14	LD	LIC	NEPHI, UT	BLANK0000059914	107.8
Yes	KULX-CD	D14	DC	LIC	OGDEN, UT	BLD TL20110323ABX	2.5
No	K14PF-D	D14	LD	LIC	PEOA, OAKLEY, UT	BLD TT20120130ADQ	70.9
No	K14PA-D	D14	LD	LIC	RURAL JUAB COUNTY, UT	BLD TT20120524AHY	136.1
No	K14RL-D	D14	LD	LIC	SAMAK, UT	BLANK0000093235	79.8
No	K14RN-D	D14	LD	LIC	SCIPIO, UT	BLANK0000137775	164.5
No	K14RU-D	D14	LD	LIC	SPRING GLEN, UT	BLANK0000093944	161.2
No	K14QS-D	D14	LD	LIC	WANSHIP, UT	BLANK0000093247	69.5
No	KFQX	D15	DT	LIC	GRAND JUNCTION, CO	BLCDT20061020ACO	345.3
No	KKJB	D15	DT	LIC	BOISE, ID	BLANK0000063943	469.4
No	K15GO-D	D15	LD	LIC	GEORGETOWN, ID	BLD TT20091005ABK	214.6
No	K15IB-D	D15	LD	LIC	MALAD, ID	BLD TT20110419ABH	155.4
Yes	KPIF	D15	DT	LIC	POCATELLO, ID	BLANK0000112831	243.9
No	KS AW-LD	D15	LD	LIC	TWIN FALLS, ID	BLD TL20140325AEJ	292.3
No	K15GS	N15	TX	LIC	DUCKWATER, ETC., NV	BLTT20040929AQF	350.7
No	K15EE-D	D15	LD	LIC	ELKO, NV	BLD TT20090716AAC	294.9
No	K15EE-D	D15	LD	CP	ELKO, NV	BPDTT20120514AEU	294.7
No	K38LR-D	D15	LD	CP	EUREKA, NV	BLANK0000054896	349.0
No	K15LY-D	D15	LD	LIC	RUTH, NV	BLANK0000087547	284.8
No	K15KX-D	D15	LD	LIC	CIRCLEVILLE, UT	BLANK0000072455	274.6
No	K15KQ-D	D15	LD	LIC	COALVILLE, UT	BLANK0000093258	72.9
No	K15LJ-D	D15	LD	LIC	ENTERPRISE, ETC., UT	BLANK0000132298	374.7
No	K15LO-D	D15	LD	LIC	FRUITLAND, UT	BLANK0000095191	122.7
No	K15KS-D	D15	LD	LIC	GARFIELD, ETC., UT	BLANK0000080322	326.5
No	K15HH-D	D15	LD	LIC	GREEN RIVER, UT	BLD TT20080123ACJ	256.3
No	K15HE-D	D15	LD	LIC	HATCH, UT	BLD TT20081223AAA	334.4
Yes	K21DY-D	D15	LD	CP	HEBER CITY, UT	BLANK0000052796	62.9
No	K15LC-D	D15	LD	LIC	HENRIEVILLE, UT	BLANK0000074879	348.7
No	K15KZ-D	D15	LD	LIC	KOOSHAREM, UT	BLANK0000084389	247.1
No	K15LL-D	D15	LD	LIC	LEAMINGTON, UT	BLANK0000125321	128.2
Yes	KUTO-LD	D15	LD	LIC	LOGAN, UT	BLD TL20130528AIC	135.0
Yes	KUTO-LD	D15	LD	CP	LOGAN, UT	BLANK0000117253	106.7
No	K15CD-D	D15	LD	LIC	MAYFIELD, UT	BLD TT20090811AAA	178.6
No	K15FQ-D	D15	LD	LIC	MILFORD, ETC., UT	BLD TT20070228ABG	257.6
No	K15HG-D	D15	LD	LIC	MOUNT PLEASANT, UT	BLD TT20080722ABC	144.7
No	K15LQ-D	D15	LD	LIC	ORANGEVILLE, UT	BLANK0000094683	187.0
No	K15LA-D	D15	LD	LIC	PANGUITCH, UT	BLANK0000080754	318.8
Yes	K15FL-D	D15	LD	LIC	PARK CITY, UT	BLD TT20090414AFN	57.4
No	K15KY-D	D15	LD	LIC	RICHFELD, ETC., UT	BLANK0000064384	227.9
Yes	K15LP-D	D15	LD	LIC	RURAL CARBON COUNTY, UT	BLANK0000093969	145.6
No	K15KT-D	D15	LD	LIC	RURAL SEVIER COUNTY, UT	BLANK0000083226	243.8
No	K15LK-D	D15	LD	LIC	SCIPIO, UT	BLANK0000139801	164.5
No	K15KU-D	D15	LD	LIC	TEASDALE, TORREY, UT	BLANK0000080567	273.2
No	K15LW-D	D15	LD	LIC	UTAHN, UT	BLANK0000095150	124.5
No	K15DI	N15	TX	LIC	VERNAL, UT	BLTT19940328JF	262.0
No	K15GZ-D	D15	LD	LIC	WENDOVER, UT	BLD TT20110928ADG	154.6
No	K16MW-D	D16	LD	LIC	MALAD CITY, ID	BLANK0000074791	155.4

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No	K16IX-D	D16	LD	LIC	PRESTON, ID	BLDTT20111005AJB	164.3
No	K16NC-D	D16	LD	LIC	FRUITLAND, UT	BLANK0000095179	122.7
No	K16MK-D	D16	LD	LIC	LAKETOWN, ETC., UT	BLANK0000093606	154.5
No	K16MT-D	D16	LD	LIC	LEAMINGTON, UT	BLANK0000125187	128.2
No	K16HV-D	D16	LD	LIC	MAYFIELD, UT	BLDTT20090831AAK	179.4
No	K16IB-D	D16	LD	LIC	MOUNT PLEASANT, UT	BLDTT20100506ADJ	144.7
No	K16MX-D	D16	LD	LIC	MYTON, UT	BLANK0000095189	124.5
No	K23KB-D	D16	LD	LIC	NEPHI, UT	BLANK0000059918	107.8
No	KULU-LD	D16	LD	LIC	PARK CITY, UT	BLDTL20120618AAV	63.8
No	K16NA-D	D16	LD	LIC	PRICE, UT	BLANK0000093957	145.6
No	K43JV	D16--	LD	CP	PROVO, UT	BLANK0000049057	51.2
No	K16MU-D	D16	LD	LIC	SCIPIO, UT	BLANK0000137749	164.5
No	K16MN-D	D16	LD	LIC	WENDOVER, UT	BLANK0000115845	154.6
No	K16HW-D	D16	LD	LIC	EVANSTON, ETC., WY	BLANK0000093968	132.4
No	K11DN	D16	LD	CP	MOUNTAIN VIEW, ETC., WY	BLANK0000143235	174.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D15+
Mask: Full Service
Latitude: 40 40 55.70 N (NAD83)
Longitude: 112 12 11.50 W
Height AMSL: 2656.1 m
HAAT: 0.0 m
Peak ERP: 5.00 kW
Antenna: DIE-TUA-C1X-01/01 (ID 1004289) 100.0 deg
Elev Pattn: Generic

48.8 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.002 kW	1355.1 m	22.5 km
45.0	0.382	1302.5	57.7
90.0	4.63	1140.2	73.5
135.0	1.86	845.1	61.8
180.0	0.004	512.7	20.1
225.0	0.002	1248.8	22.2
270.0	0.002	1366.3	22.5
315.0	0.002	1342.0	22.4

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 1139 m

Distance to Canadian border: 924.4 km

Distance to Mexican border: 913.0 km

Conditions at FCC monitoring station: Livermore CA
Bearing: 251.3 degrees Distance: 885.2 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 93.5 degrees Distance: 591.0 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area

Study cell size: 1.00 km
Profile point spacing: 1.00 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 KBTU-CPMOD ----

Proposal receives 9.60% interference from scenario 1

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Proposal receives 9.60% interference from scenario 2
No IX check failures found.

III. RF Exposure Study

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.

$$S(\mu W / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

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.

Power density levels produced by the proposed facility were calculated for an elevation of 2 meters above ground (14 meters below the antenna radiation center). The worst case power density levels occur at depression angles between 45 and 90 degrees below the horizontal. The calculations in this report assume a worst-case relative field value of 0.246 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Dielectric DLP-8J antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 302.6 watts at depression angles between 45 and 90 degrees below the horizontal. Assuming this power and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down), the highest calculated power density from the proposed antenna alone occurs at the base of the antenna support structure. At this point the power density is calculated to be 51.6 $\mu W/cm^2$, which is 3.3% of 1586.5 $\mu W/cm^2$ (the FCC maximum for controlled environments at the Channel 15 frequency). The transmitter site on "Peak 8662", 2.5 kilometers north of Farnsworth Peak, is remote and not generally accessible to the general population. Access to the site is only via a rugged unimproved road. It is considered a controlled access site.

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(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's 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, 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.

May 6, 2021

Erik C. Swanson, P.E.