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**Engineering Statement
Minor Change Application for K31HZ-D
Channel 31 at The Dalles, OR
March 2012**

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting, licensee of digital TV translator station K31HZ-D at The Dalles, Oregon. This material has been prepared in connection with an application for minor change.

I. Allocation 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 facilities with which contour overlap exists. This study was performed using the SunDTV program from V-Soft Communications and a 1 km grid spacing. The SunDTV program identically duplicates the FCC's OET-69 processing program.

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 allocation and interference study, it is believed that the proposed facility can operate without risk of interference to other stations.

Summary Study

Percent allowed new interference: 0.500
Percent allowed new interference to non Class A LPTV: 2.000
Census data selected 2000
Data Base Selected
./data_files/pt_tvdb.sff

WARNING WARNING WARNING

The following list of station records has been excluded from the analysis due to the fact that they have the same state, city and channel as the proposed station - This could cause the program to not find a potential fail situation

You can force the program to include these records by setting the state of the proposed record to ZZ and re-running the analysis

K31HZ-D 31 THE DALLES, ETC. OR BLDTT 20091125AAT

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 03-07-2012 Time: 15:10:00

Record Selected for Analysis

K31HZ-D USERRECORD-01 THE DALLES, ETC. OR US
Channel 31 ERP 2.06 kW HAAT 598. m RCAMSL 00982 m STRINGENT MASK
Latitude 045-42-43 Longitude 0121-06-58
Status APP Zone 2 Border Site number: 01
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 0.
Last update Cutoff date Docket
Comments
Applicant

Cell Size for Service Analysis 1.0 km/side

Distance Increments for Longley-Rice Analysis 1.00 km

Not full service station

Service Class = LD

Maximum height/power limits not checked

Site number	1			
Azimuth	ERP	HAAT	51.0 dBu F(50,90)	
(Deg)	(kW)	(m)	(km)	
0.0	2.060	460.5	51.0	
45.0	2.060	410.3	49.5	
90.0	2.060	472.0	51.4	
135.0	2.060	760.0	57.7	
180.0	2.060	795.1	58.3	
225.0	2.060	737.2	57.3	
270.0	2.060	670.1	56.0	
315.0	2.060	477.2	51.6	

Contour Overlap to Proposed Station

Contour Overlap Evaluation to Proposed Station Complete

NO LANDMOBILE SPACING VIOLATIONS FOUND

Checks to Site Number 01

Proposed facility OK to FCC Monitoring Stations

Proposed facility OK toward West Virginia quiet zone

Proposed facility OK toward Table Mountain

Proposed facility is within the Canadian coordination distance
Distance to border = 327.8km

Proposed facility is beyond the Mexican coordination distance

Proposed station is OK toward AM broadcast stations

Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
31	K31HZ-D	THE DALLES, ETC. OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
16	KORS-CD	SALEM OR	128.4	CP	BPTTA	-20040902AAJ
24	KKEI-CA	PORTLAND OR	128.4	APP	BDISTTA	-20090102ACF
28	K28CQ	HOOD RIVER OR	36.0	LIC	BLTT	-20100322ADF
30	K30EW	MONUMENT, ETC. OR	152.4	LIC	BLTTL	-19950818JD
30	K30EW	MONUMENT, ETC. OR	152.4	CP	BDFCDTL	-20090824ACH
30	KOAB-TV	WARM SPRINGS OR	105.2	LIC	BLEDT	-20111104AIS
30	KPDX	VANCOUVER WA	128.6	CP	BPCDT	-20110630AAI
30	KPDX	VANCOUVER WA	128.6	CP MOD	BMPCDT	-20080619AGD
30	KPDX	VANCOUVER WA	128.6	LIC	BLCDT	-20090612ADJ
30	K30KA-D	WENATCHEE WA	182.0	CP	BDCCDTT	-20061030AGI
30	KUNW-LD	YAKIMA WA	102.5	LIC	BLDTL	-20090923ACQ
31	KLSR-TV	EUGENE OR	246.8	LIC	BLCDT	-20070104ADQ
31	K31GN	LA GRANDE OR	267.3	LIC	BLTT	-20030609AAT
31	K31GN	LA GRANDE OR	267.3	CP	BDFCDTT	-20090921ACF
31	K05KI	LAKEVIEW OR	396.4	CP	BDISDTL	-20090824AKG
31	K31CR-D	PRINEVILLE, ETC. OR	168.7	LIC	BLDTT	-20081016AEI
31	K31HK	RAINIER OR	143.2	LIC	BLTT	-20070502ABR
31	K31HK	RAINIER OR	143.2	CP	BDFCDTT	-20090821ACO
31	K31AE	SUTHERLIN OR	302.4	CP	BDFCDTT	-20100408AAR
31	K31AE	SUTHERLIN OR	302.4	LIC	BLTT	-19970513JB
31	K31AK	ELLENSBURG, ETC. WA	143.7	LIC	BLTT	-19880615IE
31	KONG	EVERETT WA	233.2	APP	BPCDT	-20080617AEE
31	KONG	EVERETT WA	233.2	LIC	BLCDT	-20060627ADG
31	K31IR-D	GRAYS RIVER WA	205.2	LIC	BLDTT	-20100222AAX
31	K31KT-D	MOSES LAKE WA	219.5	CP	BNPDTL	-20090825ALT
31	K31AH-D	OMAK, ETC WA	333.6	LIC	BLDTT	-20110727AHS
31	K31AH-D	OMAK, ETC. WA	333.6	APP	BSTA	-20101115DMS
31	K31LU-D	PASCO WA	172.0	CP	BNPDTL	-20090825AKE
31	K54DU	RICHLAND WA	150.4	CP	BDISDTL	-20091015AAD
31	NEW	RICHLAND WA	132.4	APP	BNPDTL	-20090825AGT
31	K31KL-D	WALLA WALLA WA	214.9	LIC	BLDTA	-20091207ADH
32	K64AO	BLACK BUTTE RANCH OR	157.8	CP	BDISDTT	-20110916ACU
32	K62EI	MAUPIN OR	58.6	CP	BDISDTT	-20090824AAG
32	K32CC	MONTGOMERY RANCH,ETC OR	206.6	CP	BDFCDTL	-20100326ACI
32	K32CC	MONTGOMERY RANCH,ETC OR	206.6	LIC	BLTT	-19881013IC

32	KOPB-TV	NEWBERG OR	151.1	CP	BDRTEDT	-20111216AAB
32	K32DE	PENDLETON OR	152.4	CP	BDFCDTT	-20111101AHC
32	K32DE	PENDLETON, ETC. OR	152.4	LIC	BLTT	-19950127JH
32	K32IG-D	ELLENSBURG, ETC. WA	140.6	LIC	BLDTT	-20090506ACO
32	NEW	PASCO WA	168.3	APP	BNPDTL	-20101001AAF
32	K32JE-D	QUINCY WA	188.4	CP	BNPDTL	-20090825ADN
32	K32FN	WENATCHEE WA	182.0	LIC	BLTT	-20030605AEC
34	K34KE	HOOD RIVER OR	36.0	LIC	BLTT	-20100323AAM
35	KORK-CA	PORTLAND OR	128.4	LIC	BLTTA	-20070831ACZ
38	KKEI-CA	PORTLAND OR	128.4	LIC	BLTTA	-20070831ADB
39	K39DM	ELLENSBURG WA	140.7	APP	BLTTL	-20090709AEB

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Study of this proposal found the following interference problem(s):

NONE.

II. RF Exposure Study

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01) states in part that:

When performing an evaluation for compliance with the FCC's RF guidelines all significant contributors to the ambient RF environment should be considered. . . For purposes of such consideration, significance can be taken to mean any transmitter producing more than 5% of the applicable exposure limit (in terms of power density or the square of the electric or magnetic field strength) at accessible locations.

As will be demonstrated below, the proposed operation of K31HZ-D will produce less than 5% of the applicable exposure limit for both controlled and uncontrolled environments. Thus, the proposed facility is categorically excluded from the requirement of further study. Therefore, pursuant to §1.1307(b)(3) of the Commission's Rules no calculations are required for the other FM and TV facilities in the vicinity, and precise calculations are made only with regard to the levels from this proposal.

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 (16 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 0.2 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein 771304 antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 82.4 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 10.8 $\mu W/cm^2$, which is 2.8% of 381 $\mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 31 frequency).

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 1000 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 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 non-ionizing radiation 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 radiation in excess of FCC guidelines.

March 8, 2012

Erik C. Swanson, P.E.