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Engineering Statement
Application for Digital Companion Channel for TV Translator Station
K02NW at Reedsport, OR
August 2011

This Engineering Statement has been prepared on behalf of Oregon Public Broadcasting, in connection with an application for a digital companion channel for TV translator station K02NW at Reedsport, Oregon.

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
TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 08-19-2011 Time: 16:11:22

Record Selected for Analysis

K02NW USERRECORD-01 REEDSPORT OR US
Channel 20 ERP 0.78 kW HAAT 129. m RCAMSL 00210 m SIMPLE MASK
Latitude 043-43-21 Longitude 0124-05-40
Status APP Zone 2 Border Site number: 01
Dir Antenna Make usr Model USRPAT01 Beam tilt N Ref Azimuth 195.
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 (Deg)	ERP (kW)	HAAT (m)	51.0 dBu F(50,90) (km)
0.0	0.005	154.1	10.0
45.0	0.000	83.5	3.7
90.0	0.002	48.8	4.3
135.0	0.057	52.6	10.9
180.0	0.646	132.9	29.5
225.0	0.382	161.9	28.7
270.0	0.006	205.6	12.0
315.0	0.002	189.8	8.8

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 beyond the Canadian coordination distance

Proposed facility is beyond the Mexican coordination distance

Proposed station is 2.53km from AM station
REEDSPORT OR NEW Status: Antenna: DAN

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Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
20	K02NW	REEDSPORT OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
18	K18FR-D	NEWPORT OR	115.0	CP	BPTT	-20080321ACA
19	K19HI-D	ASHLAND, ETC. OR	192.4	CP	BDCCDTT	-20061030AHA
19	K19GH-D	EUGENE, ETC. OR	98.0	LIC	BLDTA	-20091211AEO
19	K19HS-D	GRANTS PASS OR	151.3	CP MOD	BMPDTT	-20071015AJY
19	K19HS-D	GRANTS PASS OR	151.3	LIC	BLDTT	-20080714ACF
19	K19EC-D	MAPLETON OR	53.5	LIC	BLDTL	-20100223ACV
19	K19EI-D	PACIFIC C/CLOVERDALE OR	167.9	LIC	BLDTT	-20091124AGX
19	KPIC	ROSEBURG OR	82.5	CP	BPCDT	-20080618ATJ
19	KPIC	ROSENBURG OR	82.5	LIC	BLCDT	-20060707ADF
20	K20DE-D	ALTURAS/LIKELY CA	406.6	LIC	BLDTT	-20080826AAS
20	K20CN	FORTUNA, RIO DELL CA	367.1	LIC	BLTTL	-19891012JL
20	K20DD	ALBANY, ETC. OR	125.6	LIC	BLTTL	-19940114JN
20	K20DD	ALBANY, ETC. OR	125.6	CP	BDFCDTL	-20090630ACM
20	KQRE-LD	BEND OR	263.1	CP	BDCCDTL	-20110223ABM
20	K20IR-D	COTTAGE GROVE OR	84.7	LIC	BLDTT	-20090303ACH
20	K20DT	GRANTS PASS OR	155.4	LIC	BLTTL	-19970818JD
20	K20EH	HOOD RIVER OR	299.9	LIC	BLTTL	-19940114JR
20	K20EH	HOOD RIVER OR	299.7	CP	BPTTL	-20070815ABA
20	K20EH	HOOD RIVER OR	299.7	CP	BDFCDTL	-20090824ACD
20	K20KV-D	MEDFORD OR	165.0	CP	BNPDTL	-20100301ADM
20	K29GX-D	MERLIN OR	133.3	APP	BPTTL	-20040108AKI
20	K20BI	NESIKA BEACH OR	148.9	CP	BDFCDTT	-20100827ABV
20	K20BI	NESIKA BEACH OR	148.9	LIC	BLTT	-19980413JV
20	K20HT	ROCKAWAY OR	225.0	LIC	BLTT	-20030609AGF
20	K20HT	ROCKAWAY BEACH OR	225.0	CP	BDFCDTT	-20100429ACE
20	KOXI-CA	CAMAS WA	226.7	LIC	BLTTA	-20070831ACY
21	K57GP	BROOKINGS OR	178.6	CP	BDISDTL	-20090804ABX
21	K21AI	CAMAS VALLEY OR	85.2	LIC	BLTT	-19871124IB
21	K32ET	CANYONVILLE OR	112.3	CP	BDISDTL	-20090818ABQ
21	K21JI-D	CAVE JUNCTION, ETC. OR	166.5	LIC	BLDTT	-20091118ACE
21	K21FS-D	EUGENE OR	103.3	LIC	BLDTT	-20101029ACP
21	NEW	GRANTS PASS OR	138.1	APP	BNPDTL	-20090825BGL
21	K21BG-D	JACKSONVILLE OR	192.4	LIC	BLDTT	-20090521AFG
21	K21LB-D	LINCOLN CITY OR	136.2	CP	BNPDTL	-20100324ACD
21	K21GX	SALEM OR	158.8	LIC	BLTTL	-20070103AAN
22	K22GX	TRI CITY OR	99.7	LIC	BLTT	-20060405AAH

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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 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 (38 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 0.200 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Kathrein broadband panel antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 31.2 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 0.7 μW/cm², which is 0.2% of 337 μW/cm² (the FCC maximum for uncontrolled environments at the Channel 20 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.

August 19, 2011
Erik C. Swanson, P.E.