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Engineering Statement
Application for a New Digital TV Translator Station
Channel 34 at Seneca, OR
February 2010

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

Summary Study

Census data selected: 2000

Post DTV Transition Database Selected

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 02-12-2010 Time: 13:06:16

Record Selected for Analysis

SENECA USERRECORD-01 SENECA OR US
Channel 34 ERP 0.3 kW HAAT 365. m RCAMSL 01806 m SIMPLE MASK
Latitude 044-17-39 Longitude 0119-02-28
Status APP Zone 2 Border
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

Facility meets maximum power limit

Azimuth (Deg)	ERP (kW)	HAAT (m)	51.0 dBu F(50,90) (km)
0.0	0.246	700.7	43.1
45.0	0.219	417.0	36.2
90.0	0.020	267.6	18.9
135.0	0.187	230.1	28.7
180.0	0.265	343.3	34.9
225.0	0.015	312.3	19.1
270.0	0.003	125.5	7.7
315.0	0.008	525.9	20.8

Contour Overlap to Proposed Station

Contour Overlap Evaluation to Proposed Station Complete

LANDMOBILE SPACING VIOLATIONS FOUND

NONE

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 OK toward AM broadcast stations

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Start of Interference Analysis

Channel	Proposed Station Call	City/State	ARN
34	SENECA	SENECA OR	USERRECORD01

Stations Potentially Affected by Proposed Station

Chan	Call	City/State	Dist(km)	Status	Application	Ref. No.
33	K33AG	BEND OR	184.0	LIC	BLTTL	-19871223ID
33	K33AG	BEND OR	184.0	CP	BDFCDTT	-20060330ADV
33	K33FS	ELGIN OR	152.9	LIC	BLTT	-20011212AAB
33	K33FS	LA GRANDE OR	152.9	CP	BDFCDTT	-20090921ACD
33	K33CJ	WASCO/HEPPNER OR	203.6	LIC	BLTTL	-19980903JE
33	K33EJ	WALLA WALLA WA	199.9	CP	BDFCDTA	-20091110AAD
33	K33EJ	WALLA WALLA WA	199.9	LIC	BLTTA	-20090928AKK
34	NEW	MOUNTAIN HOME ID	289.7	APP	BNPDTL	-20090825BLD
34	K34FP	VALMY & RED HOUSE NV	396.4	LIC	BLTT	-20030903ABI
34	K34IC	GLIDE OR	338.3	CP	BDFCDTL	-20090804ABY
34	K34IC	GLIDE OR	338.3	LIC	BLTTL	-20061113AAJ
34	NEW	HARRISBURG OR	325.7	APP	BNPDTL	-20090825APQ
34	K40AM	HOOD RIVER OR	256.2	CP	BDISTT	-20070815ABG
34	K40AM	HOOD RIVER, ETC. OR	256.6	APP	BSTA	-20070815ABP
34	K34DI	LA GRANDE OR	104.1	LIC	BLTT	-19920304II
34	K34AI-D	LA PINE OR	202.0	LIC	BLDTT	-20090821ABT
34	K49JE-D	MURPHY, ETC. OR	401.5	APP	BSTA	-20060707AFC
34	K34DJ	PHOENIX, ETC. OR	373.0	LIC	BLTT	-19920408IC
34	KKEI-LD	PORTLAND OR	322.0	CP	BDCCDTL	-20061027ACO
34	K05MG	SWEET HOME OR	314.3	APP	BDISDTL	-20090729AED
34	K65AE	TERREBONNE OR	170.8	CP	BDISTT	-20061212ABJ
34	K65AE	TERREBONNE OR	170.5	CP	BDFCDTT	-20090820ABD
34	K34IF	WALLOWA OR	179.1	LIC	BLTT	-20080902ACX
34	NEW	KENNEWICK WA	209.0	APP	BNPDTL	-20090825BIZ
34	K34HK	LONGVIEW WA	370.9	LIC	BLTTL	-20080509AAL
34	K34HK	LONGVIEW WA	371.0	APP	BSTA	-20061109ADS
34	KGPX-TV	SPOKANE WA	391.4	CP	BPCDT	-20070501AFH
34	K34JV-D	WALLA WALLA, ETC. WA	181.5	CP	BDCCDTT	-20070418ACO
34	K34EM	WENATCHEE WA	360.3	CP	BDFCDTT	-20060329AES
34	K34EM	WENATCHEE WA	360.3	LIC	BLTT	-19971030JA
35	K17ED	PAYETTE ID	172.1	APP	BDISDTA	-20091013AFQ
35	K35GA	LA GRANDE OR	152.9	CP	BDFCDTT	-20090921ACC
35	K35GA	LA GRANDE OR	152.9	LIC	BLTT	-20011212AAE
35	K35FO	MILTON-FREEWATER OR	181.8	LIC	BLTT	-20020724AAD
35	K35FO	MILTON-FREEWATER OR	181.6	CP	BDFCDTT	-20090728AFE
36	K36BA	BURNS OR	80.4	LIC	BLTT	-19880222IE
36	K36DP	PENDLETON, ETC. OR	104.1	LIC	BLTT	-19950512IH
36	K36HV	WALLOWA OR	179.1	LIC	BLTT	-20080902ABL
36	K36EW-D	COLLEGE PARK WA	200.8	LIC	BLTTL	-19991018AAB
36	KBWU-LD	RICHLAND, ET AL WA	201.3	APP	BSTA	-20070516AAW
38	K38DT	NORTH LAPINE OR	202.0	LIC	BLTT	-19930401JG
38	K38AH	PENDLETON, ETC. OR	104.1	LIC	BLTT	-19950612II
41	KBND-LP	BEND OR	184.2	LIC	BLTT	-20041025AEO
41	K41HZ	BURNS OR	80.4	LIC	BLTT	-20060526ALC
41	K41CL	WASCO/HEPPNER OR	203.6	LIC	BLTTL	-19980903JG
42	K42AI	BAKER OR	106.3	LIC	BLTT	-19820511IC
42	K42BR	TERREBONNE-BEND, ETC OR	164.2	LIC	BLTTL	-19880729IU

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

NONE.

II. NIER 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 (6 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 UHF broadband antenna array proposed in this application. This relative field value yields a worst-case adjusted

average effective radiated power of 12 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 11.1 μW/cm², which is 2.8% of 395 μW/cm² (the FCC maximum for uncontrolled environments at the Channel 34 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.

February 12, 2010
Erik C. Swanson, P.E.