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**Engineering Statement**
**Digital Flash Cut Application for K65AE**
**(Analog Displacement CP as K34JR)**
**Channel 34 at Terrebonne, OR**
**August 2009**

This Engineering Statement has been prepared on behalf of NVT Portland Licensee, LLC, licensee of TV translator station K65AE at Terrebonne, Oregon. K65AE holds an analog displacement construction permit on Channel 34 as K34JR. This material has been prepared in connection with an application for digital flash cut on Channel 34.

## 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

Census data selected: 2000

Post DTV Transition Database Selected

TV INTERFERENCE and SPACING ANALYSIS PROGRAM

Date: 07-29-2009  Time: 21:28:06

Record Selected for Analysis

K65AE  USERRECORD-06  TERREBONNE  OR US
Channel 34 ERP 4.  kW  HAAT  67. m  RCAMSL 00842 m STRINGENT MASK
Latitude 044-34-45  Longitude 0121-09-09
Status APP  Zone 2  Border
Dir Antenna Make usr  Model USRPAT06  Beam tilt N  Ref Azimuth 191.
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 | 0.036 | 111.7 | 13.5 |
| 45.0 | 0.003 | 57.4 | 5.6 |
| 90.0 | 0.015 | 33.0 | 6.2 |
| 135.0 | 0.436 | 33.0 | 14.0 |
| 180.0 | 3.618 | 33.0 | 23.4 |
| 225.0 | 1.753 | 33.0 | 20.0 |
| 270.0 | 0.024 | 94.5 | 11.5 |
| 315.0 | 0.017 | 146.7 | 13.0 |

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

Proposed Station

| Channel | Call | City/State | ARN |
|---|---|---|---|
| 34 | K65AE | TERREBONNE OR | USERRECORD06 |

Stations Potentially Affected by Proposed Station

| Chan | Call | City/State | Dist(km) | Status | Application Ref. No. |
|---|---|---|---|---|---|
| 33 | K33AG | BEND OR | 57.5 | LIC | BLTTL -19871223ID |
| 33 | K33AG | BEND OR | 57.5 | CP | BDFCDTT -20060330ADV |
| 33 | K57GW | LONDON SPRINGS OR | 187.0 | CP | BDISTT -20051122AEP |
| 33 | K57GW | LONDON SPRINGS OR | 186.9 | CP | BDISDTT -20081105ADM |
| 33 | KRCW-TV | SALEM OR | 162.0 | CP | BPCDT -20080619AKY |
| 33 | KRCW-TV | SALEM OR | 162.0 | LIC | BMLCDT -20070123ABS |
| 33 | K33CJ | WASCO/HEPPNER OR | 141.6 | LIC | BLTTL -19980903JE |
| 34 | K34KJ | CRESCENT CITY, ETC. CA | 380.0 | LIC | BLTTL -20090126ABG |
| 34 | K34DC | ASTORIA OR | 286.0 | LIC | BLTT -19920505IJ |
| 34 | K34IC | GLIDE OR | 203.3 | LIC | BLTTL -20061113AAJ |
| 34 | K40AM | HOOD RIVER OR | 133.5 | CP | BDISTT -20070815ABG |
| 34 | K40AM | HOOD RIVER, ETC. OR | 133.9 | APP | BSTA -20070815ABP |
| 34 | K34DI | LA GRANDE OR | 162.4 | LIC | BLTT -19920304II |
| 34 | K34AI | LA PINE OR | 83.2 | CP | BDFCDTT -20090630AEM |
| 34 | K34BV | MURPHY, ETC. OR | 309.2 | LIC | BLTT -19880715IE |
| 34 | K34BV | MURPHY, ETC. OR | 295.8 | APP | BSTA -20060707AFC |
| 34 | K34AI | NORTH LA PINE OR | 83.2 | LIC | BLTT -19881013IB |
| 34 | K34DJ | PHOENIX, ETC. OR | 284.4 | LIC | BLTT -19920408IC |
| 34 | KKEI-LD | PORTLAND OR | 163.2 | CP | BDCCDTL -20061027ACO |
| 34 | K61EH | POWERS OR | 298.8 | CP | BDISDTT -20090211ADI |
| 34 | K34AI | SUNRIVER OR | 83.2 | CP | BPTT -20050606AIA |
| 34 | K34IF | WALLOWA OR | 309.6 | LIC | BLTT -20080902ACX |
| 34 | K34HK | LONGVIEW WA | 226.7 | LIC | BLTTL -20080509AAL |
| 34 | K34HK | LONGVIEW WA | 226.8 | APP | BSTA -20061109ADS |
| 34 | KIRO-TV | OLYMPIA WA | 303.4 | CP | BDRTCT -20090403ACA |
| 34 | K34JV-D | WALLA WALLA, ETC. WA | 265.8 | CP | BDCCDTT -20070418ACO |
| 34 | K34EM | WENATCHEE WA | 326.5 | CP | BDFCDTT -20060329AES |
| 34 | K34EM | WENATCHEE WA | 326.5 | LIC | BLTT -19971030JA |
| 35 | K55HE | LONDON SPRINGS OR | 187.0 | CP | BDISTT -20051122AEL |
| 35 | K55HE | LONDON SPRINGS OR | 186.9 | CP | BDISDTT -20081105ADL |
| 35 | KORK-CA | PORTLAND OR | 163.2 | LIC | BLTTA -20070831ACZ |
| 35 | K35HJ | PRINEVILLE & REDMOND OR | 44.7 | CP | BNPTTL -20000829AQZ |
| 36 | K36BA | BURNS OR | 196.4 | LIC | BLTT -19880222IE |
| 36 | KXOR-LP | EUGENE OR | 168.6 | LIC | BLTTL -20020806AAT |
| 36 | K36FG | HOOD RIVER, ETC. OR | 133.5 | LIC | BLTT -20080528AAS |
| 36 | K36DP | PENDLETON, ETC. OR | 162.4 | LIC | BLTT -19950512IH |
| 36 | K66AZ | PRINEVILLE OR | 22.2 | CP | BDISTTL -20060329AGX |
| 36 | KORS-CA | SALEM OR | 163.4 | LIC | BLTTA -20020722ABK |
| 38 | K38JK | EUGENE OR | 155.5 | LIC | BLTTL -20090602AAU |
| 38 | K53EI | HOOD RIVER OR | 133.5 | CP | BDISTT -20070822ABB |
| 38 | K38DT | NORTH LAPINE OR | 83.2 | LIC | BLTT -19930401JG |
| 38 | K38AH | PENDLETON, ETC. OR | 162.4 | LIC | BLTT -19950612II |
| 38 | K38DT | SUNRIVER OR | 83.2 | CP | BPTT -20050606AHY |
| 38 | K38KU | SWEET HOME OR | 168.0 | CP | BNPTTL -20000829ANO |
| 41 | KBND-LP | BEND OR | 57.6 | CP | BPTTL -20060327AFE |
| 41 | KBND-LP | BEND OR | 57.6 | LIC | BLTT -20041025AEO |
| 41 | K41HZ | BURNS OR | 196.4 | LIC | BLTT -20060526ALC |
| 41 | KORY-CA | EUGENE OR | 168.6 | LIC | BLTTA -20020722ABH |
| 41 | K41CL | WASCO/HEPPNER OR | 141.6 | LIC | BLTTL -19980903JG |
| 42 | K42HK-D | COTTAGE GROVE OR | 175.0 | CP | BDISTT -20051122AEY |
| 42 | KPXG-LP | PORTLAND OR | 163.2 | CP | BPTTL -20050901ABW |
| 42 | K42BR | TERREBONNE-BEND, ETC OR | 18.4 | LIC | BLTTL -19880729IU |
| 42 | K42IO | ODELL WA | 125.4 | CP | BNPTTL -20000831CLQ |

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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 (17 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 0.125 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Scala 2X1KBBU broadband

antenna array proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 62.5 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 7.2 $\mu W/cm^2$, which is 1.8% of 395 $\mu W/cm^2$ (the FCC maximum for uncontrolled environments at the Channel 34 frequency).

These calculations show that the worst-case 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 18, 2009
Erik C. Swanson, P.E.