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**Engineering Statement  
Modification of K29IH-D  
Channel 29 at Meeteetse, WY  
June 2020**

This Engineering Statement has been prepared on behalf of Central Wyoming College ("CWC"), licensee of digital TV translator station K29IH-D at Meeteetse, Wyoming. This material has been prepared in connection with an application for minor change in the licensed facility, to increase power while correcting site coordinates and elevation data.

**I. 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 facilities with which contour overlap exists. 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: 2020.06.10 15:57:24

Study build station data: LMS TV 2020-06-05

Proposal: K29IH-D D29 LD APP MEETEETSE, ETC., WY  
File number: K29IH-MOD  
Facility ID: 167615  
Station data: User record  
Record ID: 967  
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	K14IL	N14	TX	LIC	PINEDALE, ETC., WY	BLTT19921228IG	171.3 km
No	K22IY	N22	TX	LIC	BIG PINEY, WY	BLTT20100119AAE	171.3
No	KWYB-LD	D28	LD	LIC	BOZEMAN, MT	BLDTL20121030AAV	226.6
No	K28LG-D	D28	LD	LIC	BRIDGER, ETC., MT	BLDTT20110207ADQ	119.5
No	K28HL-D	D28	LD	LIC	RIVERTON, WY	BLDTT20120807ABP	99.3
No	K29KY-D	D29	LD	CP	BLACKFOOT, ID	BNPDTL20100609AHK	302.2
No	K29KG-D	D29	LD	LIC	IDAHO FALLS, ID	BLANK0000087474	293.5
No	K29KG-D	D29	LD	CP	IDAHO FALLS, ID	BLANK0000088191	330.9
No	K29BM-D	D29	LD	LIC	MONTPELIER, ID	BLDTT20111116AYI	287.8
No	K29EY-D	D29	LD	LIC	PRESTON, ID	BLDTT20111116AIA	331.3
No	K29LG-D	D29	LD	LIC	SODA SPRINGS, ID	BLANK0000059259	288.3
No	K29MM-D	D29	LD	LIC	BILLINGS, MT	BLANK0000064137	181.9
No	KDBZ-CD	D29	DC	CP	BOZEMAN, MT	BLANK0000093767	247.0
No	KDBZ-CD	D29	DC	LIC	BOZEMAN, MT	BLANK0000075047	226.6
No	K29JT-D	D29	LD	CP	BUTTE, MT	BNPDTL20100310ABV	351.9
No	KUHM-TV	D29	DT	LIC	HELENA, MT	BLANK0000004580	365.3
No	KUHM-TV	D29	DT	APP	HELENA, MT	BLANK0000035768	365.3
No	K29KB-D	D29	LD	CP	MILES CITY, MT	BNPDTL20100506AEP	323.1
No	K29MX-D	D29	LD	LIC	MANILA, ETC, UT	BLANK0000095217	364.4
No	K29MY-D	D29	LD	LIC	RANDOLPH, UT	BLANK0000093592	341.6
No	K29JO-D	D29	LD	LIC	DOUGLAS, WY	BLDTT20101005AAM	330.8
No	K29HG-D	D29	LD	LIC	JACKSON, WY	BLDTL20090224AAW	175.1
No	K29HV-D	D29	LD	LIC	LA BARGE, ETC., WY	BLDTT20070523ACE	257.6
No	KSWY-LP	D29	LD	CP	SHERIDAN, WY	BLANK0000071563	159.1
No	KSWY-LP	N29	TX	LIC	SHERIDAN, WY	BLTTL20100422ADU	159.2
Yes	K29IG-D	D29	LD	LIC	SUNLIGHT BASIN, WY	BLANK0000093814	72.8
No	K30MA-D	D30	LD	CP	COLUMBUS, MT	BNPDTL20100505AGS	162.8
No	K30MB-D	D30	LD	CP	BUFFALO, WY	BNPDTL20100505AHW	171.9
Yes	K30OU-D	D30	LD	LIC	CODY, ETC, WY	BLANK0000078411	41.7
No	K30MY-D	D30	LD	CP	JACKSON, WY	BLANK0000071524	173.4
No	K30GV-D	D30	LD	LIC	SHOSHONI, WY	BLDTT20120807ABS	99.3
No	K36EZ	N36	TX	LIC	BILLINGS, MT	BLTTL20001227ABC	175.8

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D29  
Mask: Simple  
Latitude: 44 12 44.20 N (NAD83)  
Longitude: 108 51 30.00 W  
Height AMSL: 1876.0 m  
HAAT: 0.0 m  
Peak ERP: 1.25 kW  
Antenna: Omnidirectional  
Elev Pattn: Generic  
Elec Tilt: 1.75

50.2 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	1.25 kW	183.9 m	36.9 km
45.0	1.25	257.1	40.9
90.0	1.25	178.5	36.6
135.0	1.25	66.3	26.7
180.0	1.25	15.5	18.7
225.0	1.25	-4.5	18.7
270.0	1.25	-79.5	18.7

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315.0          1.25          22.2          18.7

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m    Computed HAAT: 80 m

Distance to Canadian border: 532.1 km

Distance to Mexican border: 1374.6 km

Conditions at FCC monitoring station: Grand Island NE  
Bearing: 109.6 degrees    Distance: 927.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 145.4 degrees    Distance: 540.0 km

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%

No IX check failures found.

## II. Facilities Proposed

The proposed K29IH-D facility will operate from a tower site on a hilltop 6 km north of Meeteetse, with a horizontally-polarized Scala SL-8 antenna. The tower structure does not require FCC Antenna Structure Registration.

## 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 (10 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 0.244 at these angles, based on the manufacturer's vertical plane pattern for the horizontally-polarized Scala SL-8 antenna proposed in this application. This relative field value yields a worst-case adjusted average effective radiated power of 74.42 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 24.9  $\mu W/cm^2$ , which is 6.7% of 373.3  $\mu W/cm^2$  (the FCC maximum for uncontrolled environments at the Channel 29 frequency).

Calculations of the power density produced by K29IH-D and the other stations at this transmitter site are summarized in the following table:

Call	Avg or Peak ERP Antenna Model	Elevation Relative Field	Height AGL	Calculated Max Exposure	Gen Pub FCC Limit	% of Limit
K29IH-D	1.250 kW H Scala SL-8	0.244	12 m	24.9 $\mu\text{W}/\text{cm}^2$	373.3 $\mu\text{W}/\text{cm}^2$	6.7%
K17KH-D	1.300 kW H Scala SL-8	0.244	6.7 m	117.1 $\mu\text{W}/\text{cm}^2$	325.3 $\mu\text{W}/\text{cm}^2$	36.0%
K21JU-D	1.340 kW H Scala SL-8	0.244	6.7 m	120.7 $\mu\text{W}/\text{cm}^2$	341.3 $\mu\text{W}/\text{cm}^2$	35.4%

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of K29IH-D and the present operation of the other stations at this site (were their maxima to coincide, which they do not) is 78.1% of the FCC standard for uncontrolled environments.

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.

June 10, 2020

Erik C. Swanson, P.E.