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**Engineering Statement  
CP Modification for W27EQ-D  
Channel 27 at Peoria, IL  
March 2021**

**I. Background**

This Engineering Statement has been prepared on behalf of DTV America Corporation ("DTVA"), the permittee of low power digital station W27EQ-D at Peoria, IL. This material has been prepared in connection with an application for minor modification of construction permit.

**II. 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 authorized or pending proposed facilities. 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: 2021.02.27 15:23:07

Study build station data: LMS TV 2021-02-27

Proposal: W27EQ-D D27 LD APP PEORIA, IL  
File number: W27EQ-M-OM-STR  
Facility ID: 185325  
Station data: User record  
Record ID: 1051  
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	WPVN-CD	D26	DC	LIC	CHICAGO, IL	BLANK0000106475	210.1 km
No	WBBM-TV	D26	LD	LIC	CHICAGO, IL	BLCDT20140305ABH	205.4
No	WRDH-LP	D26	LD	CP	HOLCOMB, IL	BDCCDTL20061030ANL	154.4
Yes	WMBD-TV	D26	DT	LIC	PEORIA, IL	BLANK0000098193	5.4
No	KPLR-TV	D26	DT	CP	ST. LOUIS, MO	BLANK0000127593	244.3
No	KPLR-TV	D26	DT	LIC	ST. LOUIS, MO	BLANK0000125916	238.9
No	WKOW	D26	DT	LIC	MADISON, WI	BLCDT20111006AAO	270.6
Yes	KFXA	D27	DT	LIC	CEDAR RAPIDS, IA	BLCDT20050713ABD	272.1
No	W27EL-D	D27+	LD	LIC	CHAMPAIGN, IL	BLANK0000120591	119.6
No	W27EN-D	D27	LD	CP	MOUNT VERNON, IL	BLANK0000071886	262.0
Yes	W18CJ	D27	LD	LIC	QUINCY, IL	BLANK0000023020	172.8
Yes	W48CK-D	D27	LD	LIC	STERLING, IL	BLANK0000063145	142.2
No	W27EB-D	D27	DC	LIC	SUGAR GROVE, IL	BLANK0000126802	178.6
No	W27EB-D	D27	DC	CP	SUGAR GROVE, IL	BLANK0000127638	209.1
No	W27EB-D	D27	DC	APP	SUGAR GROVE, IL	BLANK0000133270	210.1
No	WTTV	D27	DT	LIC	BLOOMINGTON, IN	BLANK0000086972	313.9
No	WSOT-LD	D27	LD	LIC	MARION, IN	BLDTL20111212AGP	325.0
No	WNDU-TV	D27	DT	LIC	SOUTH BEND, IN	BLANK0000116736	294.4
No	KOMU-TV	D27	DT	APP	COLUMBIA, MO	BLANK0000125105	306.1
No	K27OS-D	D27	LD	CP	ROLLA, MO	BNPDTL20090825BJV	355.8
No	KBGU-LD	D27	LD	LIC	ST. LOUIS, MO	BLANK0000124663	238.9
No	WVTV	D27	DT	LIC	MILWAUKEE, WI	BLANK0000121792	304.3
No	K28JD-D	D28	LD	LIC	FORT MADISON, IA	BLDTT20091229AEU	165.1
Yes	WYZZ-TV	D28	DT	LIC	BLOOMINGTON, IL	BLCDT20060609ABE	25.2
No	WRBU	D28	DT	LIC	EAST ST. LOUIS, IL	BLANK0000108757	263.0
No	W28EB-D	D28	LD	CP	EFFINGHAM, IL	BMPDTL20111006ACQ	195.8
No	WIFR-LD	D28	LD	CP	ROCKFORD, IL	BLANK0000075333	187.9

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D27  
Mask: Stringent  
Latitude: 40 37 19.00 N (NAD83)  
Longitude: 89 28 36.10 W  
Height AMSL: 293.8 m  
HAAT: 0.0 m  
Peak ERP: 15.0 kW  
Antenna: Omnidirectional  
Elev Pattn: Generic

50.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	15.0 kW	75.3 m	40.5 km
45.0	15.0	57.3	37.5
90.0	15.0	64.4	38.7
135.0	15.0	90.0	42.6
180.0	15.0	91.0	42.7
225.0	15.0	84.5	41.8
270.0	15.0	101.2	44.0
315.0	15.0	121.4	45.8

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Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m    Computed HAAT: 86 m

Distance to Canadian border: 551.0 km

Distance to Mexican border: 1617.9 km

Conditions at FCC monitoring station: Allegan MI  
Bearing: 51.8 degrees    Distance: 366.3 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 272.9 degrees    Distance: 1332.5 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%

---- Below is IX received by proposal W27EQ-M-OM-STR ----

Proposal receives 13.22% interference from scenario 1  
No IX check failures found.

### 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 using the manufacturer's vertical plane pattern for the circularly-polarized ERI ALP8L3 antenna proposed in this application. The highest calculated power density from the proposed antenna alone occurs at a point 28 meters from the base of the antenna support structure. At this point the power density from the proposed facility is calculated to be 10.8  $\mu W/cm^2$ , which is 3.0% of 365.3  $\mu W/cm^2$  (the FCC maximum for uncontrolled environments at the Channel 27 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 500 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 applicant's 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 RF exposure 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 exposure in excess of FCC guidelines.

March 1, 2021

Erik C. Swanson, P.E.

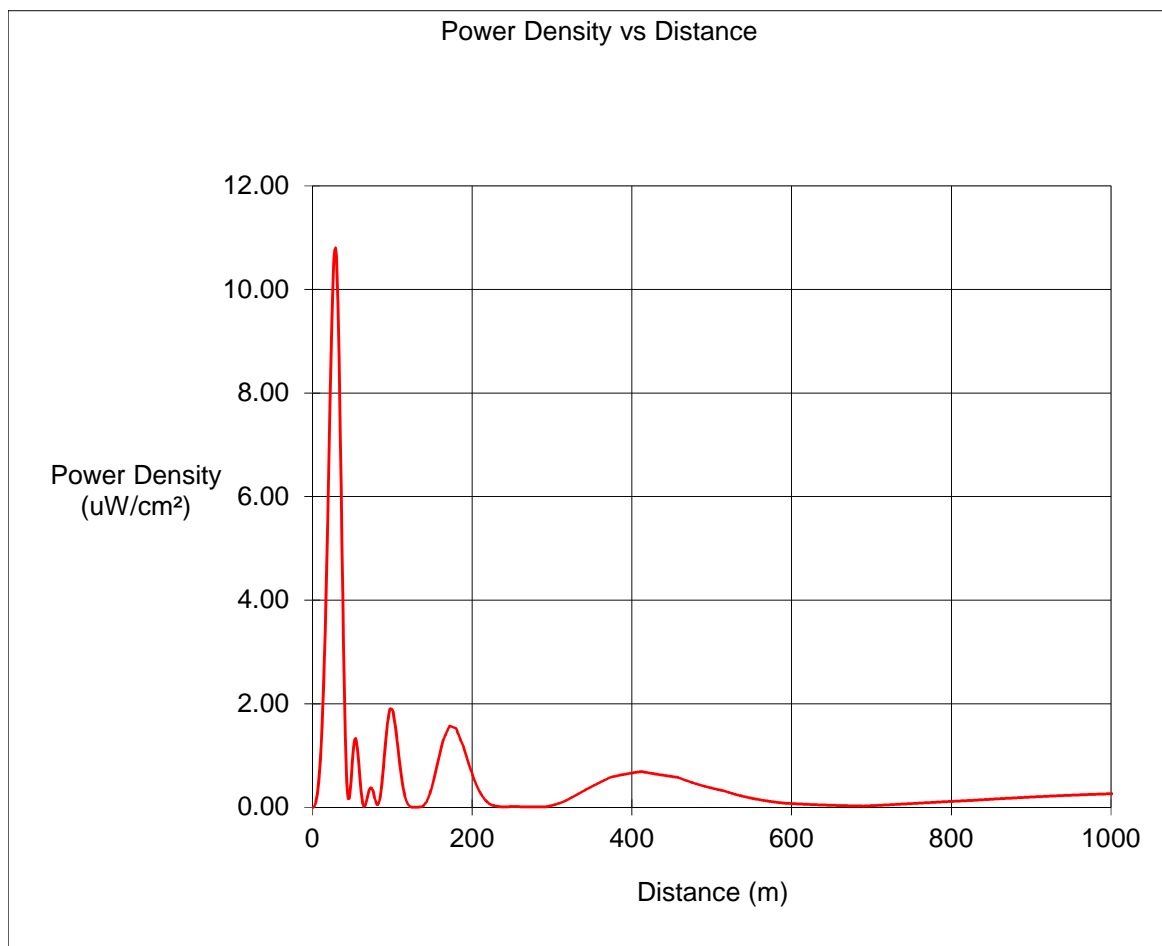
## W27EQ-D Peoria

### Ground-Level Power Density Calculations

Using Manufacturer's Vertical Plane Pattern

Antenna	ERI ALP8L3	
ERP	15,000 Watts H (avg)	
	15,000 Watts V (avg)	
Antenna AGL	74.4 meters less 2m is	72.4 meters above the reference plane
MBT	0 degrees	

Calculated  
Maximum is 10.8  $\mu\text{W}/\text{cm}^2$  at 28 meters from the tower



**W27EQ-D Peoria**  
**Ground-Level Power Density Calculations**  
**Using Manufacturer's Vertical Plane Pattern**

Distance From Tower (meters)	Hypotenuse (meters)	Depression Angle (with MBT adjust) (degrees)	Interpolated Rel Field	Adjusted ERP (watts)	Power Density uW/cm <sup>2</sup>
0	72.40	90.00	0.000	0.0	0.00
1	72.41	89.21	0.007	1.5	0.01
2	72.43	88.42	0.014	5.6	0.04
3	72.46	87.63	0.021	12.9	0.08
4	72.51	86.84	0.028	24.3	0.15
5	72.57	86.05	0.036	37.9	0.24
6	72.65	85.26	0.043	56.4	0.36
7	72.74	84.48	0.052	80.3	0.51
8	72.84	83.69	0.061	110.4	0.70
9	72.96	82.91	0.070	147.5	0.93
10	73.09	82.14	0.080	193.1	1.21
11	73.23	81.36	0.091	248.1	1.55
12	73.39	80.59	0.102	310.6	1.93
13	73.56	79.82	0.113	381.0	2.35
14	73.74	79.06	0.124	462.5	2.84
15	73.94	78.29	0.136	557.2	3.41
16	74.15	77.54	0.149	664.7	4.04
17	74.37	76.79	0.162	783.8	4.73
18	74.60	76.04	0.174	911.9	5.47
19	74.85	75.30	0.186	1040.9	6.21
20	75.11	74.56	0.198	1177.1	6.97
21	75.38	73.82	0.210	1318.3	7.75
22	75.67	73.10	0.221	1459.1	8.51
23	75.97	72.38	0.230	1588.5	9.20
24	76.27	71.66	0.238	1705.0	9.79
25	76.59	70.95	0.245	1805.9	10.28
26	76.93	70.25	0.250	1879.2	10.61
27	77.27	69.55	0.253	1925.7	10.78
28	77.63	68.86	0.255	1948.6	10.80
29	77.99	68.17	0.254	1938.1	10.65
30	78.37	67.49	0.250	1881.7	10.24
31	78.76	66.82	0.245	1798.5	9.69
32	79.16	66.16	0.237	1683.1	8.97
33	79.57	65.50	0.226	1531.4	8.08
34	79.99	64.84	0.213	1366.5	7.14
35	80.42	64.20	0.199	1183.2	6.11
36	80.86	63.56	0.182	990.8	5.06
37	81.31	62.93	0.164	804.1	4.06
38	81.77	62.31	0.143	614.5	3.07
39	82.24	61.69	0.122	447.6	2.21
40	82.71	61.08	0.101	304.8	1.49
41	83.20	60.48	0.079	188.1	0.91
42	83.70	59.88	0.059	103.3	0.49
43	84.21	59.29	0.042	53.4	0.25
44	84.72	58.71	0.034	35.3	0.16

45	85.25	58.14	0.035	36.5	0.17
46	85.78	57.57	0.045	60.5	0.27
47	86.32	57.01	0.058	100.2	0.45
48	86.87	56.46	0.071	149.1	0.66
49	87.42	55.91	0.082	203.9	0.89
50	87.99	55.37	0.091	248.8	1.07
51	88.56	54.84	0.098	288.9	1.23
52	89.14	54.31	0.102	311.0	1.31
53	89.73	53.79	0.103	320.6	1.33
54	90.32	53.28	0.102	311.2	1.27
55	90.92	52.78	0.098	290.0	1.17
56	91.53	52.28	0.092	255.8	1.02
57	92.15	51.79	0.085	214.3	0.84
58	92.77	51.30	0.074	165.8	0.64
59	93.40	50.82	0.063	120.6	0.46
60	94.03	50.35	0.051	78.4	0.30
61	94.67	49.88	0.039	44.5	0.17
62	95.32	49.42	0.025	18.4	0.07
63	95.97	48.97	0.012	4.4	0.02
64	96.63	48.52	0.014	6.2	0.02
65	97.30	48.08	0.017	8.3	0.03
66	97.97	47.65	0.026	20.0	0.07
67	98.64	47.22	0.037	40.1	0.14
68	99.33	46.80	0.045	61.5	0.21
69	100.01	46.38	0.052	81.0	0.27
70	100.71	45.97	0.058	101.6	0.33
71	101.40	45.56	0.061	110.3	0.36
72	102.11	45.16	0.063	119.3	0.38
73	102.81	44.76	0.063	117.5	0.37
74	103.53	44.37	0.060	108.9	0.34
75	104.24	43.99	0.058	100.3	0.31
76	104.97	43.61	0.051	79.2	0.24
77	105.69	43.24	0.045	60.8	0.18
78	106.42	42.87	0.038	44.1	0.13
79	107.16	42.50	0.031	29.0	0.08
80	107.90	42.15	0.024	17.1	0.05
81	108.64	41.79	0.025	18.7	0.05
82	109.39	41.44	0.032	30.0	0.08
83	110.14	41.10	0.038	43.6	0.12
84	110.90	40.76	0.049	73.3	0.20
85	111.65	40.42	0.062	117.2	0.31
86	112.42	40.09	0.075	170.5	0.45
87	113.18	39.77	0.088	231.6	0.60
88	113.96	39.45	0.100	300.5	0.77
89	114.73	39.13	0.112	377.3	0.96
90	115.51	38.81	0.123	452.0	1.13
91	116.29	38.51	0.132	525.2	1.30
92	117.07	38.20	0.142	602.9	1.47
93	117.86	37.90	0.150	673.1	1.62
94	118.65	37.60	0.155	722.0	1.71
95	119.44	37.31	0.160	771.8	1.81
96	120.24	37.02	0.166	822.7	1.90