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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 Pattnr: 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     |

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.

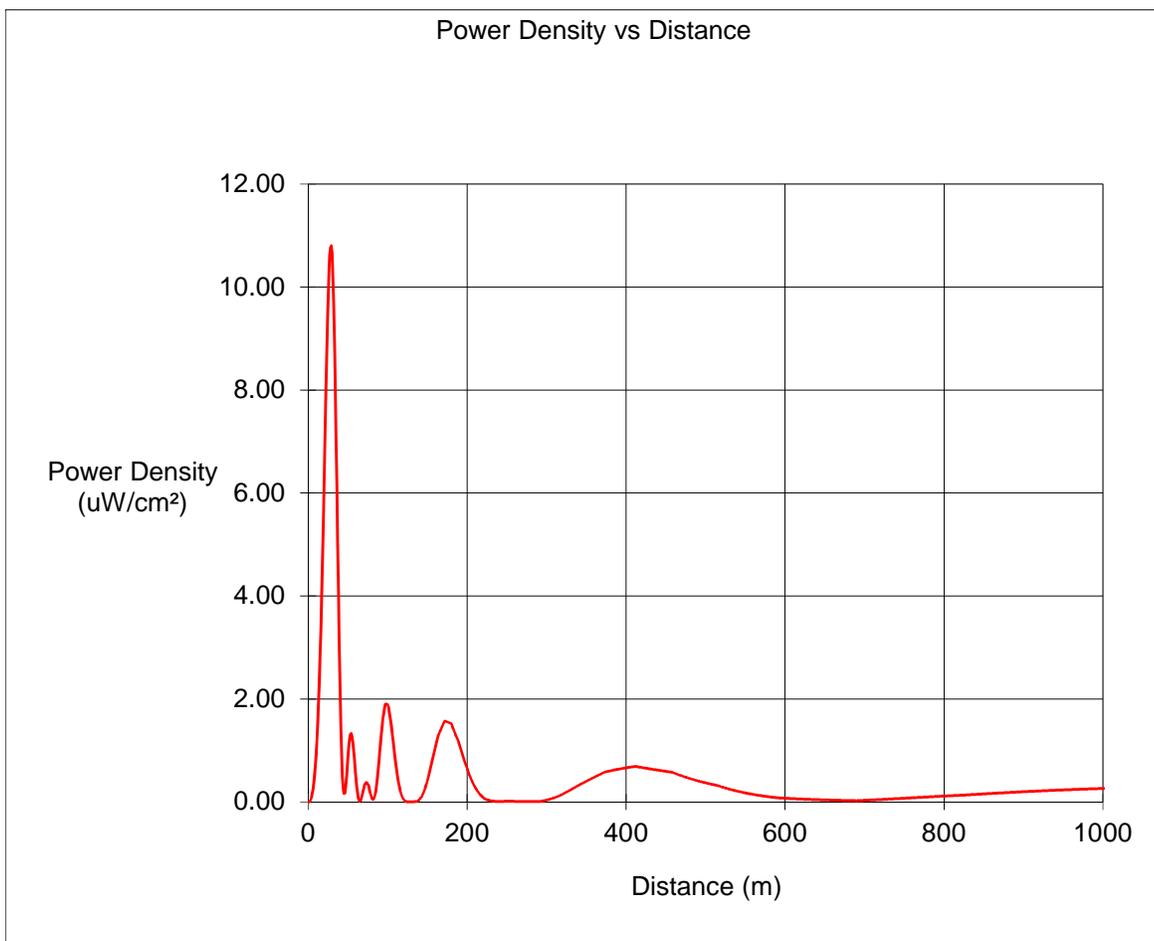
# W27EQ-D Peoria

## 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 |