



**STATEMENT OF JAMES D. SADLER  
BEFORE AND AFTER PARTIAL PROOFS  
AM STATION WWRC – WASHINGTON, DC  
IN SUPPORT OF AN APPLICATION FOR LICENSE  
FM TRANSLATOR STATION W284CQ - WASHINGTON, DC  
FACILITY ID: 31140**

Applicant: AMFM Radio Licenses, LLC

I am a Technical Consultant, an employee in the firm of Carl T. Jones Corporation with offices located in Springfield, VA. My education and experience are a matter of record with the Federal Communications Commission.

**Introduction**

FM Translator Station W284CQ is authorized in its Construction Permit, FCC File No. BMPFT-20151026ABC, to mount a new transmitting antenna and associated transmission line on the center tower of the WWRC nighttime directional array. A special operating condition was placed on the Construction Permit requiring the permittee to conduct a partial proof of performance as defined in Section 73.154 of the Commission's Rules both before and after construction to show that the AM Station has not been adversely affected.

Radio Station WWRC(AM), Washington, DC, is licensed to operate on a frequency of 1260 kHz, on an unlimited time basis, with a daytime power of 35 kW and

a nighttime power of 5 kW. The station utilizes different directional patterns for its daytime and nighttime operations (DA-2). The daytime directional antenna system employs the two end towers (Towers 2 and 3) while the nighttime directional antenna system employs all three towers including tower #1 which the W284CQ transmitting antenna is located. Just prior to the start of construction, Station WWRC filed an Application for Direct Measurement of Power, FCC Form 302-AM, (FCC File No. BZ-20151222BQR) with the Commission. The pending application contains partial proof of performance measurements for the nighttime directional antenna system. These measurements were used as the “before” measurements for the purpose of this partial proof of performance since they were completed just prior to the start of construction authorized for FM Translator Station W284CQ.

Because the center tower is not employed in the daytime directional antenna system, partial proof of performance measurements have not been performed on the daytime directional antenna pattern. Modifications to antennas and transmission lines on the center tower have been found to have little or no effect on the WWRC daytime directional antenna pattern; therefore, “before” and “after” measurements relative to the daytime directional antenna were only made at the daytime monitoring points. Due to the seasonal variation of ground conductivity expected to occur between the start of construction and the completion of construction partial proof of performance measurements were made on both the non-directional and nighttime directional antennas to provide a more accurate assessment of the effect of the construction on the WWRC antenna system.

**Non-directional and Nighttime Directional Partial Proof Field Strength Measurements**

Following the construction, the non-directional antenna impedance of Tower #1 (center) was measured, by the undersigned, using a Delta Electronics, Model OIB-1, operating impedance bridge and found to be  $Z_{ND\#1} = 132 + j 3.2$  Ohms. The transmitter was adjusted for a base current of 6.88 Amperes corresponding to a non-directional antenna input power of approximately 6,250 Watts. The measurement was performed at the J-Plug located in the output branch of the tower #1 ATU network with Towers #2 and #3 detuned. The nighttime common point impedance was adjusted for  $Z_{cp} = 50.0 - j 8.8$  Ohms and the transmitter was adjusted for a common point current of 10.39 Amperes for the nighttime directional antenna partial proof measurements.

Non-directional and nighttime directional partial proof field strength measurements were performed on all four nighttime monitored radials before and after construction. As stated, the “before” measurements were obtained directly from the pending Application for Direct Measurement of Power. A minimum of ten field strength measurements were performed on each radial bearing at the same locations that were measured in the 2012 nighttime full proof-of-performance, including the monitor point locations. All measurements were made during the period between two hours following local sunrise and two hours prior to local sunset to minimize the potential for skywave interference. The “after” measurements were made at the same locations as the “before” measurements.

The nighttime directional pattern measured inverse distance fields were determined in the following manner. The logarithm of the ratio of the nighttime directional field strength to the non-directional field strength was calculated for each measurement location, and an average logarithmic ratio determined for each radial bearing. The antilogarithm of the average was multiplied by the 2012 measured non-directional inverse distance field to determine the “before” and “after” nighttime directional inverse distance field. Figure 1 provides a summary of the “before” and “after” nighttime measured inverse distance fields. In no case does the value of the measured “before” and “after” nighttime inverse distance field exceed the authorized modified standard pattern value. A tabulation of the “before” and “after” measured nighttime directional and non-directional field strength data for each of the four measured radials is contained in Figure 2, Sheets 1 through 4.

A description of the “before” measurement procedure is contained in the pending WWRC Application for Direct Measurement of Power. All of the “after” field strength measurements were performed by Mr. Tom Ringer, a contract engineer working for Carl T. Jones Corporation, and the undersigned. A total of four field intensity meters were used to make the “after” measurements. Pertinent information on each field intensity meter is contained in the table below.

<b><u>Manufacturer/Model</u></b>	<b><u>Serial Number</u></b>	<b><u>Calibration Date</u></b>
Potomac Instruments/FIM-41	446	October, 2009
Potomac Instruments/FIM-41	989	March, 2012
Potomac Instruments/PI 4100	352	March 11, 2016
Potomac Instruments/PI 4100	353	March 11, 2016

The performance of the four field intensity meters was verified by comparing measured field strength values at several different full scale settings and verifying that the field strength values, as measured on each meter, agreed within the manufactures stated accuracy.

### **Daytime Monitoring Points**

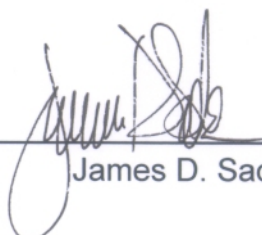
The daytime directional antenna monitoring points were measured “before” and “after” the construction. The points were within the normal variance range and well within the licensed maximum values.

### **Summary**

It is submitted that the daytime and nighttime directional patterns of Station WWRC(AM) are in proper adjustment and compliant with the station’s authorization. The construction of FM Translator Station W284CQ has not adversely effected the operation of Station WWRC.

This engineering statement and the associated figures were prepared by me or under my direct supervision and the information therein is believed to be true and correct.

Dated: March 16, 2016

  
James D. Sadler

**TABULATION OF NIGHTTIME MEASURED FIELD STRENGTH DATA  
STATION WWRC, WASHINGTON, DC  
1260 kHz, 35 kW-D, 5 kW-N, DA-2**

BEFORE MEASUREMENTS

<u>Monitored Radial (deg. T.)</u>	<u>2015 ND Inverse Distance Field Strength (mV/m at 1 km)</u>	<u>DA-N / ND Antilog of Average Ratio</u>	<u>DA-N Measured Inverse Distance Field Strength (mV/m at 1 km)</u>	<u>Nighttime Modified Standard Pattern Radiation (mV/m at 1 km)</u>
52	725	0.0725	52.5	60.0
198	760	1.1239	854	877
280	800	0.0502	40.2	61.2
325	790	0.3911	309	368

AFTER MEASUREMENTS

<u>Monitored Radial (deg. T.)</u>	<u>2012 ND Inverse Distance Field Strength (mV/m at 1 km)</u>	<u>DA-N / ND Antilog of Average Ratio</u>	<u>DA-N Measured Inverse Distance Field Strength (mV/m at 1 km)</u>	<u>Nighttime Modified Standard Pattern Radiation (mV/m at 1 km)</u>
52	725	0.0604	43.8	60.0
198	760	0.9770	743	877
280	800	0.0544	43.5	61.2
325	790	0.4335	342	368

<sup>1</sup> Non-directional inverse distance field strength obtained from most recent nighttime full proof-of-performance, FCC File No. BL-20120221ADS, Granted April 27, 2012.

**TABULATION OF FIELD STRENGTH MEASUREMENT DATA**  
**STATION WWRC, WASHINGTON, DC**  
**1260 kHz, 35 kW-D, 5 kW-N, DA-2**

## 52 Degrees True Radial

### BEFORE MEASUREMENTS

2012 Proof Point		6.25 kW, ND			5 kW, DA-NIGHT				
		Distance		Field		Field		Log	
<u>Number</u>	<u>(kilometers)</u>	<u>Date</u>	<u>Time</u>	<u>Strength</u>	<u>Date</u>	<u>Time</u>	<u>Strength</u>	<u>Ratio</u>	<u>Ratio</u>
			<u>(local)</u>	<u>(mV/m)</u>		<u>(local)</u>	<u>(mV/m)</u>	<u>(DA-N/ND)</u>	<u>(DA-N/ND)</u>
11	3.41	11/22/2015	1327	90.0	12/16/2015	1314	10	0.1111	-0.9542
12	4.22	11/22/2015	1332	52.0	12/16/2015	1310	4.5	0.0865	-1.0628
13 MP	5.58	11/22/2015	1340	28.6	12/16/2015	1303	2.39	0.0836	-1.0780
14	6.48	11/22/2015	1345	26.6	12/16/2015	1259	1.37	0.0515	-1.2882
15	7.31	11/22/2015	1349	16.4	12/16/2015	1250	0.79	0.0482	-1.3172
16	8.02	11/22/2015	1353	23.4	12/16/2015	1240	0.88	0.0376	-1.4247
17	8.24	11/22/2015	1355	14.4	12/16/2015	1318	0.62	0.0431	-1.3660
18	9.69	11/22/2015	1359	11.3	12/16/2015	1309	0.82	0.0726	-1.1393
19	11.20	11/22/2015	1404	8.70	12/16/2015	1304	0.6	0.0690	-1.1614
20	12.90	11/22/2015	1415	7.10	12/16/2015	1255	0.6	0.0845	-1.0731
21	14.00	11/22/2015	1421	5.30	12/16/2015	1246	0.72	0.1358	-0.8669
22	15.40	11/22/2015	1426	2.83	12/16/2015	1241	0.32	0.1131	-0.9466
Average Ratio								0.0780	-1.1399
Antilog of Average									0.0725

### AFTER MEASUREMENTS

2012 Proof Point		6.25 kW, ND			5 kW, DA-NIGHT					
		Distance <u>(kilometers)</u>	<u>Date</u>	Time <u>(local)</u>	Field Strength <u>(mV/m)</u>	<u>Date</u>	Time <u>(local)</u>	Field Strength <u>(mV/m)</u>	Ratio <u>(DA-N/ND)</u>	Log Ratio <u>(DA-N/ND)</u>
13 MP	11	3.41	3/12/2016	848	89.5	3/12/2016	1236	9.92	0.1108	-0.9553
	12	4.22	3/12/2016	857	52.0	3/12/2016	1241	4.25	0.0817	-1.0876
	13	5.58	3/12/2016	906	28.1	3/12/2016	1247	2.6	0.0925	-1.0337
	14	6.48	3/12/2016	911	28.0	3/12/2016	1251	1.9	0.0679	-1.1684
	15	7.31	3/12/2016	917	16.3	3/12/2016	1256	0.4	0.0245	-1.6101
	16	8.02	3/12/2016	924	23.2	3/12/2016	1300	0.52	0.0224	-1.6495
	17	8.24	3/12/2016	927	14.9	3/12/2016	1303	0.76	0.0510	-1.2924
	18	9.69	3/12/2016	933	10.6	3/12/2016	1308	0.62	0.0585	-1.2329
	19	11.20	3/12/2016	939	8.2	3/12/2016	1312	0.52	0.0634	-1.1978
	20	12.90	3/12/2016	950	6.7	3/12/2016	1321	0.4	0.0597	-1.2240
	21	14.00	3/12/2016	959	4.95	3/12/2016	1332	0.35	0.0707	-1.1505
	22	15.40	3/12/2016	1004	2.73	3/12/2016	1336	0.26	0.0952	-1.0212
Average Ratio								0.0665	-1.2186	
Antilog of Average									0.0604	







