

License Modification Application

Technical Statement

prepared for

Board of Trustees for the Vincennes University

WVUT(TV) FacID 4329

Channel 31 69.4 kW 161.2 m HAAT

Proposal

This license modification seeks to replace the existing Dielectric TLP-12C/VP-R 12-bay, elliptically-polarized antenna with a Dielectric TLP-16C/VP-R 16-bay, elliptically-polarized antenna. The new antenna has exactly the same horizontal plane pattern as the one that it is replacing, as shown in the following pages, and will be mounted 0.6 meters lower on the tower with ASR number 1028983, due to the increased size of the higher-gain antenna.

The facility continues to be in accordance with the construction permit.

Transmitter Output Power

The post-filter transmitter power output, as shown in the calculations on the next page, is 5.05 kW (7.032 dBk).

Environmental Considerations - RFE

The proposed facility for WVUT would not constitute an RF exposure hazard to persons in the vicinity of the site. Using the equations in Supplement A of OET Bulletin 65, and assuming a relative field value of 0.1 for downward angles, the calculated power density at two meters above ground is $1.54 \mu\text{W}/\text{cm}^2$ or 0.4% of the MPE limit. FCC Rule Section 1.1307(b)(3) indicates that facilities at locations with multiple emitters may be excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent of the pertinent MPE limit. Since the instant situation meets the five percent exclusion test, the impact of any other facilities near this site may be considered independently from this proposal. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at ground level as defined under §1.1307(b).

WVUT will continue to coordinate with all other users of the site to ensure that workers and other personnel are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation as necessary.

ANTENNA / LINE SYSTEM GAINS AND LOSSES

prepared September 2023 for

Board of Trustees for the Vincennes University

WVUT(TV) Vincennes, IN

Facility ID 4329

Channel 31 69.4 kW 161.2 m HAAT

Proposed Effective Radiated Power:	69.40 kW	18.41 dBk
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Antenna System

Dielectric TLP-16C/VP-R

Max Power Gain:	23.45	13.70 dB
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Antenna Input Power:	2.96 kW	4.71 dBk
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Line and Other Losses

Combination of 3-1/8" rigid and 3" air dielectric transmission line	Loss:	2.32 dB
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Total Loss:	2.32 dB
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<u>Transmitter Post-Mask Power Output:</u>	5.05 kW	7.03 dBk
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Antenna Model: **TLP-16C/VP-R**

Reference Number:

Date: **13-Oct-21**

Customer: **VINCENNES UNIVERSITY**

Location: **VINCENNES, IN**

Electrical Specifications

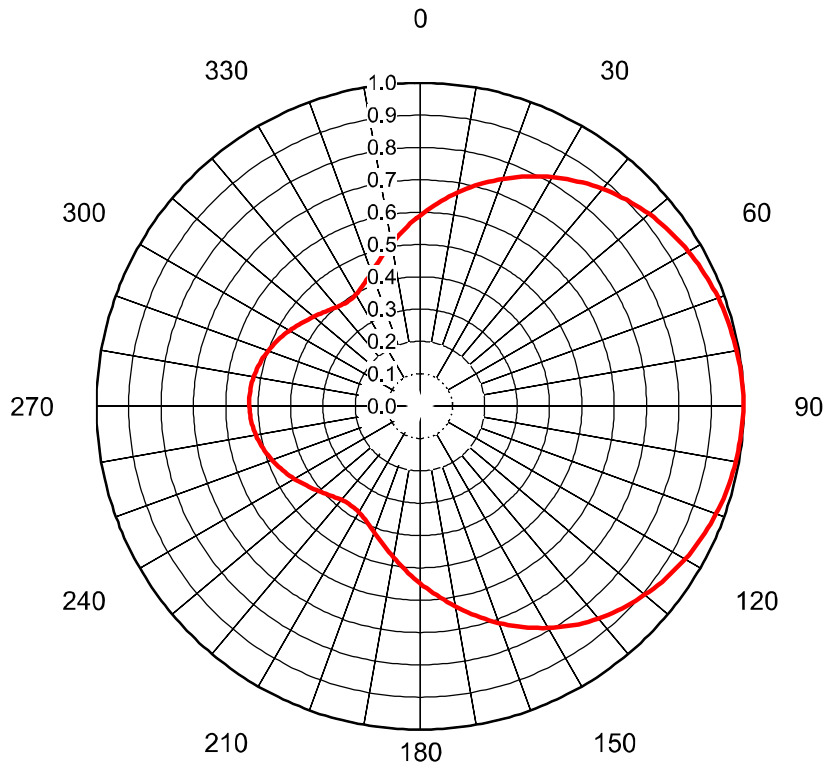
Polarization: **Elliptical / Circular**
Azimuth Pattern: **C**
Antenna Input: **1-5/8 50 Ohm**
VSWR: Channel **1.08 : 1**
Bandwidth: **6 MHz**
Rated Input Power: **4.0 kW** **Maximum Average Power**

Mechanical Specifications

Mounting: **Side Mounted**
Environmental Protection: **Full Radome**
Height: **31.3 ft (9.5 m)**
Weight: **321 lb (146 kg)** Excludes Mounts
Effective Projected Area: **27.7 ft² (2.6 m²)** Basic Wind Speed: **90 mph (145 km/h)**

Channel Specifications

Call	Ch	Freq	Hpol ERP	Vpol ERP	TPO	Peak Gain Main Lobe Hpol	Peak Gain Main Lobe Vpol	Peak Gain at Horizontal Hpol	Peak Gain at Horizontal Vpol
WVUT	31	575	69.4 kW (18.41 dBk)	27.8 kW (14.43 dBk)	4.80 kW (6.81 dBk)	23.45 (13.70dB)	9.38 (9.72dB)	16.55 (12.19dB)	6.62 (8.21dB)



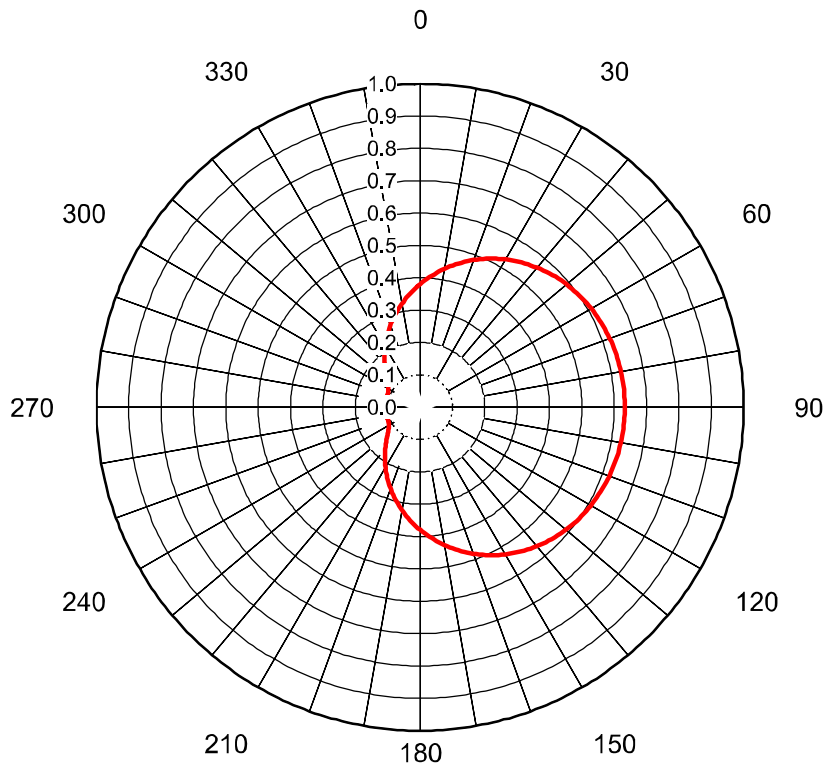
AZIMUTH PATTERN Horizontal Polarization

Proposal No.
 Date **13-Oct-21**
 Call Letters **WVUT**
 Channel **31**
 Frequency **575 MHz**
 Antenna Type **TLP-16C/VP-R**
 Gain **2.09 (3.2dB)**
 Calculated

Pattern Number **TLP-C-31 Hpol**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.590	36	0.855	72	0.983	108	0.978	144	0.833	180	0.547	216	0.373	252	0.493	288	0.505
1	0.598	37	0.860	73	0.985	109	0.976	145	0.826	181	0.539	217	0.374	253	0.497	289	0.503
2	0.606	38	0.866	74	0.986	110	0.973	146	0.820	182	0.532	218	0.375	254	0.500	290	0.500
3	0.614	39	0.872	75	0.988	111	0.971	147	0.813	183	0.524	219	0.376	255	0.502	291	0.497
4	0.622	40	0.877	76	0.989	112	0.969	148	0.806	184	0.517	220	0.378	256	0.505	292	0.494
5	0.630	41	0.882	77	0.990	113	0.966	149	0.799	185	0.510	221	0.380	257	0.508	293	0.491
6	0.638	42	0.887	78	0.991	114	0.964	150	0.792	186	0.502	222	0.382	258	0.510	294	0.488
7	0.646	43	0.892	79	0.993	115	0.961	151	0.784	187	0.495	223	0.385	259	0.513	295	0.484
8	0.654	44	0.897	80	0.994	116	0.958	152	0.777	188	0.488	224	0.387	260	0.515	296	0.481
9	0.663	45	0.902	81	0.995	117	0.955	153	0.769	189	0.481	225	0.390	261	0.517	297	0.477
10	0.671	46	0.907	82	0.995	118	0.952	154	0.761	190	0.474	226	0.394	262	0.519	298	0.474
11	0.679	47	0.911	83	0.996	119	0.949	155	0.754	191	0.468	227	0.397	263	0.520	299	0.470
12	0.686	48	0.916	84	0.997	120	0.946	156	0.746	192	0.461	228	0.401	264	0.522	300	0.467
13	0.694	49	0.920	85	0.998	121	0.942	157	0.737	193	0.455	229	0.404	265	0.523	301	0.463
14	0.702	50	0.924	86	0.998	122	0.939	158	0.729	194	0.448	230	0.408	266	0.524	302	0.459
15	0.710	51	0.928	87	0.999	123	0.935	159	0.721	195	0.442	231	0.412	267	0.525	303	0.455
16	0.718	52	0.932	88	0.999	124	0.932	160	0.713	196	0.436	232	0.416	268	0.526	304	0.452
17	0.725	53	0.935	89	0.999	125	0.928	161	0.704	197	0.430	233	0.420	269	0.527	305	0.448
18	0.733	54	0.939	90	1.000	126	0.924	162	0.696	198	0.425	234	0.424	270	0.527	306	0.444
19	0.741	55	0.942	91	0.999	127	0.920	163	0.687	199	0.420	235	0.428	271	0.528	307	0.440
20	0.748	56	0.946	92	0.998	128	0.916	164	0.679	200	0.414	236	0.432	272	0.528	308	0.437
21	0.755	57	0.949	93	0.997	129	0.912	165	0.670	201	0.410	237	0.437	273	0.528	309	0.433
22	0.763	58	0.952	94	0.996	130	0.907	166	0.662	202	0.405	238	0.441	274	0.527	310	0.430
23	0.770	59	0.955	95	0.995	131	0.903	167	0.653	203	0.401	239	0.445	275	0.527	311	0.426
24	0.777	60	0.958	96	0.995	132	0.898	168	0.645	204	0.396	240	0.449	276	0.526	312	0.423
25	0.784	61	0.960	97	0.994	133	0.893	169	0.637	205	0.393	241	0.453	277	0.525	313	0.419
26	0.791	62	0.963	98	0.993	134	0.889	170	0.628	206	0.389	242	0.457	278	0.524	314	0.416
27	0.798	63	0.965	99	0.992	135	0.884	171	0.620	207	0.386	243	0.461	279	0.523	315	0.413
28	0.804	64	0.968	100	0.990	136	0.878	172	0.611	208	0.383	244	0.465	280	0.522	316	0.410
29	0.811	65	0.970	101	0.989	137	0.873	173	0.603	209	0.381	245	0.469	281	0.520	317	0.407
30	0.818	66	0.972	102	0.988	138	0.868	174	0.595	210	0.378	246	0.472	282	0.518	318	0.405
31	0.824	67	0.974	103	0.986	139	0.862	175	0.587	211	0.377	247	0.476	283	0.517	319	0.402
32	0.830	68	0.976	104	0.985	140	0.857	176	0.579	212	0.375	248	0.480	284	0.515	320	0.400
33	0.837	69	0.978	105	0.983	141	0.851	177	0.571	213	0.374	249	0.483	285	0.512	321	0.398
34	0.843	70	0.980	106	0.981	142	0.845	178	0.563	214	0.373	250	0.487	286	0.510	322	0.396
35	0.849	71	0.982	107	0.980	143	0.839	179	0.555	215	0.373	251	0.490	287	0.508	323	0.395

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AZIMUTH PATTERN Vertical Polarization

Proposal No.
 Date **13-Oct-21**
 Call Letters **WVUT**
 Channel **31**
 Frequency **575 MHz**
 Antenna Type **TLP-16C/VP-R**
 Gain **2.27 (3.56dB)**
 Calculated

Pattern Number **TLP-C-31 Vpol**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.381	36	0.550	72	0.625	108	0.624	144	0.547	180	0.378	216	0.184	252	0.107	288	0.108
1	0.387	37	0.554	73	0.626	109	0.623	145	0.544	181	0.373	217	0.180	253	0.107	289	0.108
2	0.392	38	0.557	74	0.627	110	0.622	146	0.540	182	0.367	218	0.175	254	0.108	290	0.108
3	0.397	39	0.560	75	0.628	111	0.621	147	0.537	183	0.362	219	0.171	255	0.108	291	0.108
4	0.403	40	0.563	76	0.628	112	0.620	148	0.533	184	0.356	220	0.167	256	0.108	292	0.108
5	0.408	41	0.567	77	0.629	113	0.619	149	0.529	185	0.351	221	0.162	257	0.109	293	0.108
6	0.414	42	0.570	78	0.630	114	0.618	150	0.525	186	0.345	222	0.158	258	0.109	294	0.108
7	0.419	43	0.573	79	0.630	115	0.617	151	0.521	187	0.339	223	0.154	259	0.109	295	0.108
8	0.424	44	0.576	80	0.630	116	0.615	152	0.517	188	0.334	224	0.151	260	0.110	296	0.109
9	0.430	45	0.578	81	0.631	117	0.614	153	0.513	189	0.328	225	0.147	261	0.110	297	0.109
10	0.435	46	0.581	82	0.631	118	0.612	154	0.508	190	0.323	226	0.143	262	0.110	298	0.110
11	0.440	47	0.584	83	0.632	119	0.611	155	0.504	191	0.317	227	0.140	263	0.111	299	0.111
12	0.445	48	0.586	84	0.632	120	0.609	156	0.500	192	0.311	228	0.137	264	0.111	300	0.112
13	0.450	49	0.589	85	0.632	121	0.607	157	0.495	193	0.306	229	0.134	265	0.111	301	0.113
14	0.455	50	0.591	86	0.632	122	0.606	158	0.491	194	0.300	230	0.131	266	0.111	302	0.115
15	0.460	51	0.593	87	0.632	123	0.604	159	0.486	195	0.294	231	0.128	267	0.112	303	0.116
16	0.465	52	0.596	88	0.632	124	0.602	160	0.481	196	0.289	232	0.126	268	0.112	304	0.118
17	0.470	53	0.598	89	0.632	125	0.600	161	0.477	197	0.283	233	0.123	269	0.112	305	0.120
18	0.475	54	0.600	90	0.632	126	0.598	162	0.472	198	0.278	234	0.121	270	0.112	306	0.122
19	0.480	55	0.602	91	0.632	127	0.596	163	0.467	199	0.272	235	0.119	271	0.112	307	0.124
20	0.484	56	0.604	92	0.632	128	0.594	164	0.462	200	0.267	236	0.117	272	0.112	308	0.127
21	0.489	57	0.606	93	0.632	129	0.591	165	0.457	201	0.261	237	0.115	273	0.112	309	0.129
22	0.494	58	0.607	94	0.632	130	0.589	166	0.452	202	0.256	238	0.114	274	0.112	310	0.132
23	0.498	59	0.609	95	0.632	131	0.586	167	0.447	203	0.250	239	0.112	275	0.111	311	0.135
24	0.503	60	0.611	96	0.631	132	0.584	168	0.442	204	0.245	240	0.111	276	0.111	312	0.138
25	0.507	61	0.612	97	0.631	133	0.581	169	0.437	205	0.240	241	0.110	277	0.111	313	0.142
26	0.511	62	0.614	98	0.631	134	0.579	170	0.432	206	0.234	242	0.109	278	0.111	314	0.145
27	0.515	63	0.615	99	0.630	135	0.576	171	0.427	207	0.229	243	0.108	279	0.110	315	0.149
28	0.520	64	0.617	100	0.630	136	0.573	172	0.422	208	0.224	244	0.108	280	0.110	316	0.152
29	0.524	65	0.618	101	0.629	137	0.570	173	0.416	209	0.219	245	0.107	281	0.110	317	0.156
30	0.528	66	0.619	102	0.629	138	0.567	174	0.411	210	0.214	246	0.107	282	0.109	318	0.160
31	0.532	67	0.620	103	0.628	139	0.564	175	0.406	211	0.209	247	0.107	283	0.109	319	0.164
32	0.536	68	0.622	104	0.627	140	0.561	176	0.400	212	0.204	248	0.107	284	0.109	320	0.168
33	0.539	69	0.623	105	0.627	141	0.558	177	0.395	213	0.199	249	0.107	285	0.108	321	0.173
34	0.543	70	0.624	106	0.626	142	0.554	178	0.389	214	0.194	250	0.107	286	0.108	322	0.177
35	0.547	71	0.625	107	0.625	143	0.551	179	0.384	215	0.189	251	0.107	287	0.108	323	0.181

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ELEVATION PATTERN

Proposal No.

Date **13-Oct-21**

Call Letters **WVUT**

Channel **31**

Frequency **575 MHz**

Antenna Type **TLP-16C/VP-R**

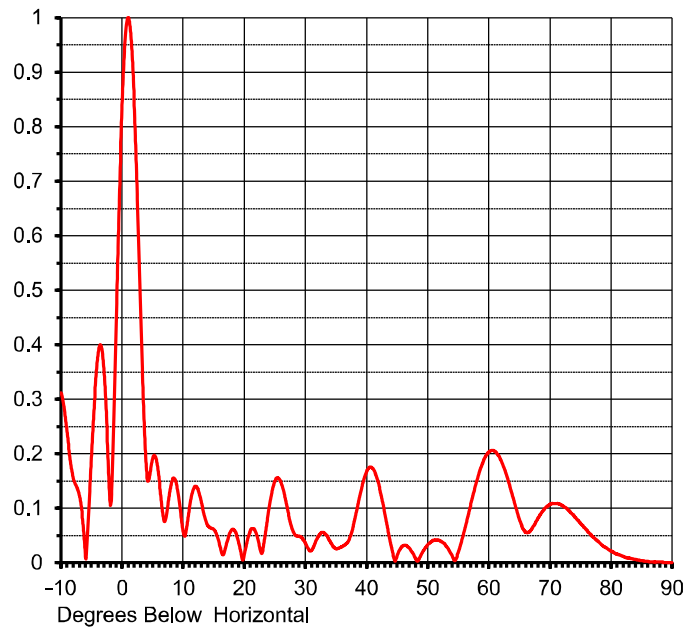
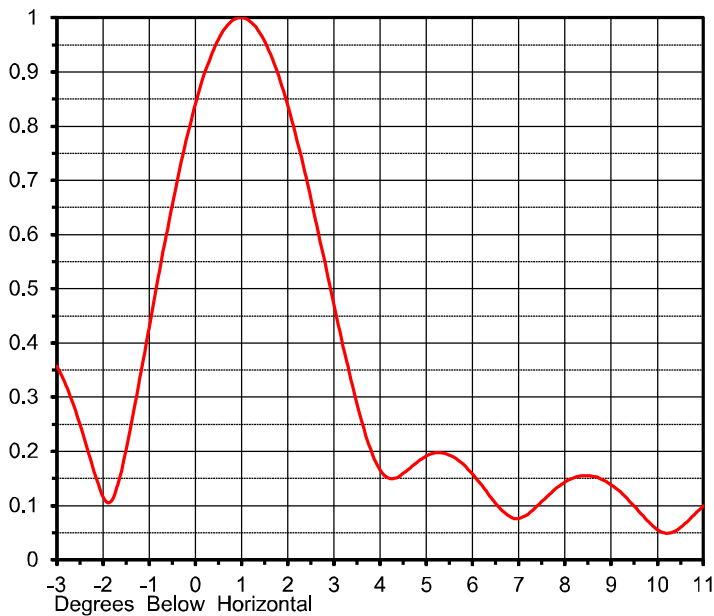
RMS Directivity at Main Lobe **15.4 (11.87 dB)**

RMS Directivity at Horizontal **10.8 (10.33 dB)**

Calculated

Beam Tilt **1.00 deg**

Pattern Number **16L154100-31**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.312	10.0	0.056	30.0	0.036	50.0	0.033	70.0	0.107
-9.0	0.238	11.0	0.099	31.0	0.023	51.0	0.041	71.0	0.109
-8.0	0.156	12.0	0.140	32.0	0.046	52.0	0.040	72.0	0.105
-7.0	0.123	13.0	0.110	33.0	0.055	53.0	0.031	73.0	0.097
-6.0	0.012	14.0	0.068	34.0	0.040	54.0	0.013	74.0	0.085
-5.0	0.199	15.0	0.061	35.0	0.026	55.0	0.018	75.0	0.073
-4.0	0.377	16.0	0.031	36.0	0.030	56.0	0.058	76.0	0.060
-3.0	0.357	17.0	0.030	37.0	0.039	57.0	0.104	77.0	0.048
-2.0	0.116	18.0	0.061	38.0	0.075	58.0	0.148	78.0	0.038
-1.0	0.428	19.0	0.041	39.0	0.127	59.0	0.183	79.0	0.029
0.0	0.840	20.0	0.015	40.0	0.167	60.0	0.203	80.0	0.022
1.0	1.000	21.0	0.059	41.0	0.173	61.0	0.204	81.0	0.016
2.0	0.838	22.0	0.052	42.0	0.144	62.0	0.188	82.0	0.012
3.0	0.471	23.0	0.022	43.0	0.090	63.0	0.158	83.0	0.008
4.0	0.166	24.0	0.097	44.0	0.032	64.0	0.119	84.0	0.006
5.0	0.191	25.0	0.150	45.0	0.012	65.0	0.080	85.0	0.004
6.0	0.158	26.0	0.148	46.0	0.031	66.0	0.056	86.0	0.003
7.0	0.076	27.0	0.102	47.0	0.027	67.0	0.061	87.0	0.002
8.0	0.143	28.0	0.057	48.0	0.008	68.0	0.080	88.0	0.001
9.0	0.138	29.0	0.048	49.0	0.016	69.0	0.097	89.0	0.000
								90.0	0.000

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