

**Antenna Model:****TFU-32ETT/VP-R 06**

Proposal Number: **C-71029-3**
Date: **26-Feb-20**
Customer: **FOX TV**
Location: **Washington, DC**

Electrical Specifications

Polarization: **Elliptical**
Azimuth Pattern: **Omni**
Antenna Input: **8-3/16"** **75 Ohm** **EIA/DCA**
VSWR: **Channel** **1.08 : 1**
Bandwidth: **6 MHz**
Rated Input Power: **70 kW** **(18.45 dBk)** **Maximum Average Power**

Mechanical Specifications

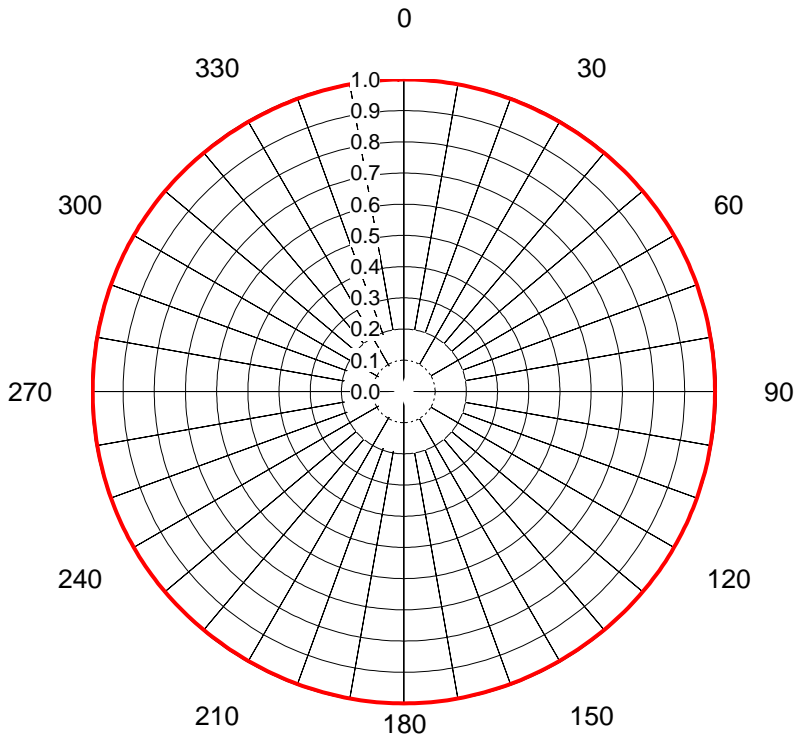
Mounting: **Top Mounted**
Environmental Protection: **Full Radome**
Height: **55.6 ft (16.9m)** less Lightning Protector **59.6 ft (18.2m)** with Lightning Protector
Weight: **6000 lb (2.7t)**
Effective Projected Area: **63.2 ft² (5.9m²)** **TIA-222-G** Basic Wind Speed: **90 m/h (144.8 km/h)**

Channel Specifications

Call	CH	Freq	Hpol ERP	Vpol ERP	TPO	RMS	RMS	RMS	RMS
						Main Lobe Hpol Gain	Main Lobe Vpol Gain	at Horizontal Hpol Gain	at Horizontal Vpol Gain
WTTG	36	605 MHz	1,000 kW (30.00 dBk)	500 kW (26.99 dBk)	63.1 kW (18.00 dBk)	18.60 (12.70dB)	9.30 (9.68dB)	14.37 (11.57dB)	7.19 (8.56dB)

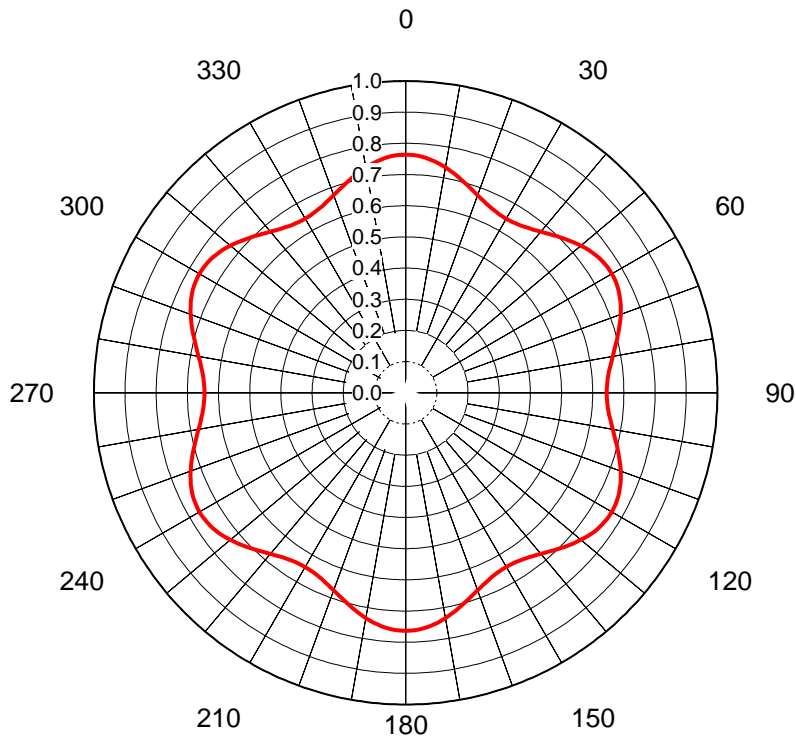
AZIMUTH PATTERN Horizontal Polarization

Proposal No. **C-71029-3**
 Date **26-Feb-20**
 Call Letters **WTTG**
 Channel **36**
 Frequency **605 MHz**
 Antenna Type **TFU-32ETT/VP-R O6**
 Gain **1 (0.01dB)**
 Circularity **Calculated
+/- 1.0 dB**



Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.998	72	0.999	108	0.999	144	0.998	180	1.000	216	0.998	252	0.999	288	0.999
1	1.000	37	0.998	73	0.999	109	0.999	145	0.998	181	1.000	217	0.998	253	0.999	289	0.999
2	1.000	38	0.998	74	0.999	110	0.999	146	0.997	182	1.000	218	0.998	254	0.999	290	0.999
3	1.000	39	0.998	75	0.999	111	0.999	147	0.997	183	1.000	219	0.998	255	0.999	291	0.999
4	1.000	40	0.998	76	0.998	112	0.999	148	0.997	184	1.000	220	0.998	256	0.998	292	0.999
5	1.000	41	0.998	77	0.998	113	1.000	149	0.997	185	1.000	221	0.998	257	0.998	293	1.000
6	1.000	42	0.998	78	0.998	114	1.000	150	0.997	186	1.000	222	0.998	258	0.998	294	1.000
7	1.000	43	0.998	79	0.998	115	1.000	151	0.997	187	1.000	223	0.998	259	0.998	295	1.000
8	0.999	44	0.998	80	0.998	116	1.000	152	0.997	188	0.999	224	0.998	260	0.998	296	1.000
9	0.999	45	0.999	81	0.998	117	1.000	153	0.997	189	0.999	225	0.999	261	0.998	297	1.000
10	0.999	46	0.999	82	0.998	118	1.000	154	0.997	190	0.999	226	0.999	262	0.998	298	1.000
11	0.999	47	0.999	83	0.998	119	1.000	155	0.998	191	0.999	227	0.999	263	0.998	299	1.000
12	0.999	48	0.999	84	0.998	120	1.000	156	0.998	192	0.999	228	0.999	264	0.998	300	1.000
13	0.999	49	0.999	85	0.998	121	1.000	157	0.998	193	0.999	229	0.999	265	0.998	301	1.000
14	0.999	50	0.999	86	0.997	122	1.000	158	0.998	194	0.999	230	0.999	266	0.997	302	1.000
15	0.999	51	0.999	87	0.997	123	1.000	159	0.998	195	0.999	231	0.999	267	0.997	303	1.000
16	0.998	52	0.999	88	0.997	124	1.000	160	0.998	196	0.998	232	0.999	268	0.997	304	1.000
17	0.998	53	1.000	89	0.997	125	1.000	161	0.998	197	0.998	233	1.000	269	0.997	305	1.000
18	0.998	54	1.000	90	0.997	126	1.000	162	0.998	198	0.998	234	1.000	270	0.997	306	1.000
19	0.998	55	1.000	91	0.997	127	1.000	163	0.998	199	0.998	235	1.000	271	0.997	307	1.000
20	0.998	56	1.000	92	0.997	128	0.999	164	0.998	200	0.998	236	1.000	272	0.997	308	0.999
21	0.998	57	1.000	93	0.997	129	0.999	165	0.999	201	0.998	237	1.000	273	0.997	309	0.999
22	0.998	58	1.000	94	0.997	130	0.999	166	0.999	202	0.998	238	1.000	274	0.997	310	0.999
23	0.998	59	1.000	95	0.998	131	0.999	167	0.999	203	0.998	239	1.000	275	0.998	311	0.999
24	0.998	60	1.000	96	0.998	132	0.999	168	0.999	204	0.998	240	1.000	276	0.998	312	0.999
25	0.998	61	1.000	97	0.998	133	0.999	169	0.999	205	0.998	241	1.000	277	0.998	313	0.999
26	0.997	62	1.000	98	0.998	134	0.999	170	0.999	206	0.997	242	1.000	278	0.998	314	0.999
27	0.997	63	1.000	99	0.998	135	0.999	171	0.999	207	0.997	243	1.000	279	0.998	315	0.999
28	0.997	64	1.000	100	0.998	136	0.998	172	0.999	208	0.997	244	1.000	280	0.998	316	0.998
29	0.997	65	1.000	101	0.998	137	0.998	173	1.000	209	0.997	245	1.000	281	0.998	317	0.998
30	0.997	66	1.000	102	0.998	138	0.998	174	1.000	210	0.997	246	1.000	282	0.998	318	0.998
31	0.997	67	1.000	103	0.998	139	0.998	175	1.000	211	0.997	247	1.000	283	0.998	319	0.998
32	0.997	68	0.999	104	0.998	140	0.998	176	1.000	212	0.997	248	0.999	284	0.998	320	0.998
33	0.997	69	0.999	105	0.999	141	0.998	177	1.000	213	0.997	249	0.999	285	0.999	321	0.998
34	0.997	70	0.999	106	0.999	142	0.998	178	1.000	214	0.997	250	0.999	286	0.999	322	0.998
35	0.998	71	0.999	107	0.999	143	0.998	179	1.000	215	0.998	251	0.999	287	0.999	323	0.998

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AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-71029-3**
 Date **26-Feb-20**
 Call Letters **WTTG**
 Channel **36**
 Frequency **605 MHz**
 Antenna Type **TFU-32ETT/VP-R O6**
 Gain **1.17 (0.69dB)**
 Calculated
 Circularity **+/- 1.0 dB**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.764	36	0.656	72	0.723	108	0.723	144	0.656	180	0.764	216	0.656	252	0.723	288	0.723
1	0.763	37	0.660	73	0.717	109	0.728	145	0.653	181	0.763	217	0.660	253	0.717	289	0.729
2	0.763	38	0.665	74	0.711	110	0.734	146	0.650	182	0.763	218	0.665	254	0.711	290	0.734
3	0.761	39	0.669	75	0.704	111	0.739	147	0.648	183	0.761	219	0.669	255	0.704	291	0.739
4	0.759	40	0.675	76	0.698	112	0.744	148	0.646	184	0.759	220	0.675	256	0.698	292	0.744
5	0.756	41	0.680	77	0.692	113	0.749	149	0.645	185	0.756	221	0.680	257	0.692	293	0.749
6	0.752	42	0.686	78	0.686	114	0.752	150	0.645	186	0.752	222	0.686	258	0.686	294	0.752
7	0.749	43	0.692	79	0.680	115	0.756	151	0.645	187	0.749	223	0.692	259	0.680	295	0.756
8	0.744	44	0.698	80	0.675	116	0.759	152	0.646	188	0.744	224	0.698	260	0.675	296	0.759
9	0.739	45	0.704	81	0.669	117	0.761	153	0.648	189	0.739	225	0.704	261	0.669	297	0.761
10	0.734	46	0.711	82	0.665	118	0.763	154	0.650	190	0.734	226	0.711	262	0.665	298	0.763
11	0.728	47	0.717	83	0.660	119	0.763	155	0.653	191	0.728	227	0.717	263	0.660	299	0.763
12	0.723	48	0.723	84	0.656	120	0.764	156	0.656	192	0.723	228	0.723	264	0.656	300	0.764
13	0.717	49	0.728	85	0.653	121	0.763	157	0.660	193	0.717	229	0.728	265	0.653	301	0.763
14	0.711	50	0.734	86	0.650	122	0.763	158	0.665	194	0.711	230	0.734	266	0.650	302	0.763
15	0.704	51	0.739	87	0.648	123	0.761	159	0.669	195	0.704	231	0.739	267	0.648	303	0.761
16	0.698	52	0.744	88	0.646	124	0.759	160	0.675	196	0.698	232	0.744	268	0.646	304	0.759
17	0.692	53	0.749	89	0.645	125	0.756	161	0.680	197	0.692	233	0.749	269	0.645	305	0.756
18	0.686	54	0.752	90	0.645	126	0.752	162	0.686	198	0.686	234	0.752	270	0.645	306	0.752
19	0.680	55	0.756	91	0.645	127	0.749	163	0.692	199	0.680	235	0.756	271	0.645	307	0.749
20	0.675	56	0.759	92	0.646	128	0.744	164	0.698	200	0.675	236	0.759	272	0.646	308	0.744
21	0.669	57	0.761	93	0.648	129	0.739	165	0.704	201	0.669	237	0.761	273	0.648	309	0.739
22	0.665	58	0.763	94	0.650	130	0.734	166	0.711	202	0.665	238	0.763	274	0.650	310	0.734
23	0.660	59	0.763	95	0.653	131	0.728	167	0.717	203	0.660	239	0.763	275	0.653	311	0.728
24	0.656	60	0.764	96	0.656	132	0.723	168	0.723	204	0.656	240	0.764	276	0.656	312	0.723
25	0.653	61	0.763	97	0.660	133	0.717	169	0.729	205	0.653	241	0.763	277	0.660	313	0.717
26	0.650	62	0.763	98	0.665	134	0.711	170	0.734	206	0.650	242	0.763	278	0.665	314	0.711
27	0.648	63	0.761	99	0.669	135	0.704	171	0.739	207	0.648	243	0.761	279	0.669	315	0.704
28	0.646	64	0.759	100	0.675	136	0.698	172	0.744	208	0.646	244	0.759	280	0.675	316	0.698
29	0.645	65	0.756	101	0.680	137	0.692	173	0.749	209	0.645	245	0.756	281	0.680	317	0.692
30	0.645	66	0.752	102	0.686	138	0.686	174	0.752	210	0.645	246	0.752	282	0.686	318	0.686
31	0.645	67	0.749	103	0.692	139	0.680	175	0.756	211	0.645	247	0.749	283	0.692	319	0.680
32	0.646	68	0.744	104	0.698	140	0.675	176	0.759	212	0.646	248	0.744	284	0.698	320	0.675
33	0.648	69	0.739	105	0.704	141	0.669	177	0.761	213	0.648	249	0.739	285	0.704	321	0.669
34	0.650	70	0.734	106	0.711	142	0.665	178	0.763	214	0.650	250	0.734	286	0.711	322	0.665
35	0.653	71	0.728	107	0.717	143	0.660	179	0.763	215	0.653	251	0.728	287	0.717	323	0.660

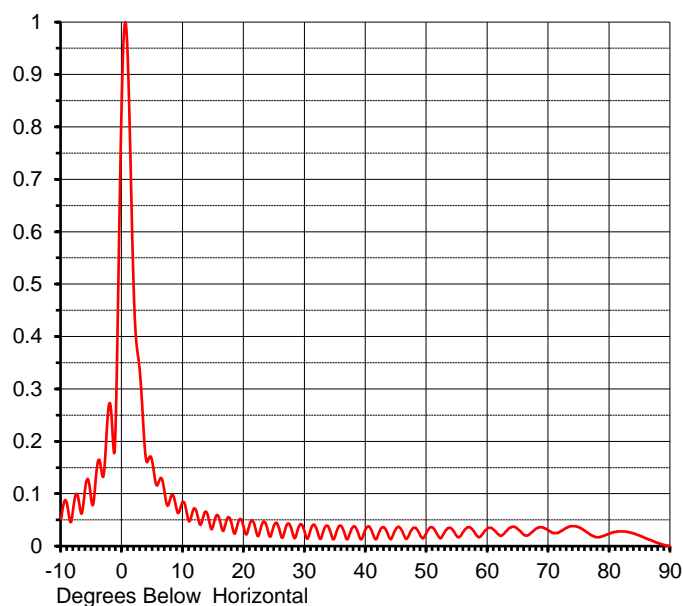
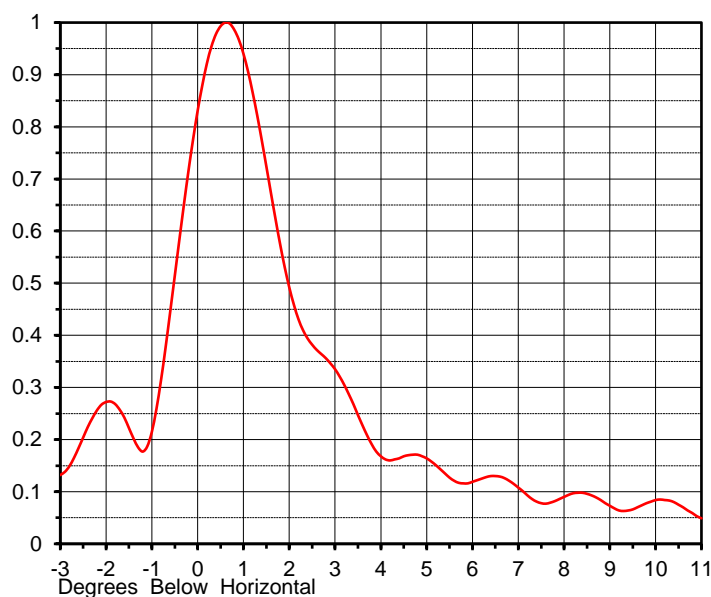
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ELEVATION PATTERN

Proposal No. **C-71029-3**
 Date **26-Feb-20**
 Call Letters **WTTG**
 Channel **36**
 Frequency **605 MHz**
 Antenna Type **TFU-32ETT/VP-R O6**

RMS Directivity at Main Lobe **27.9 (14.46 dB)**
 RMS Directivity at Horizontal **21.6 (13.34 dB)**
Calculated

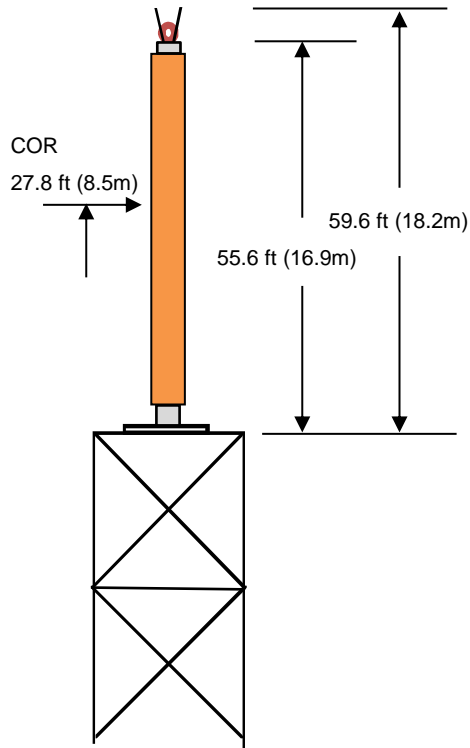
Beam Tilt **0.50 deg**
 Pattern Number **32E279050**



Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10.0	0.052	10.0	0.085	30.0	0.026	50.0	0.027	70.0	0.030
-9.0	0.078	11.0	0.047	31.0	0.033	51.0	0.035	71.0	0.025
-8.0	0.074	12.0	0.071	32.0	0.030	52.0	0.017	72.0	0.028
-7.0	0.079	13.0	0.043	33.0	0.027	53.0	0.028	73.0	0.035
-6.0	0.115	14.0	0.061	34.0	0.033	54.0	0.034	74.0	0.038
-5.0	0.084	15.0	0.041	35.0	0.020	55.0	0.018	75.0	0.036
-4.0	0.160	16.0	0.050	36.0	0.038	56.0	0.027	76.0	0.029
-3.0	0.138	17.0	0.043	37.0	0.013	57.0	0.036	77.0	0.021
-2.0	0.273	18.0	0.041	38.0	0.037	58.0	0.023	78.0	0.017
-1.0	0.259	19.0	0.044	39.0	0.016	59.0	0.021	79.0	0.019
0.0	0.879	20.0	0.034	40.0	0.033	60.0	0.034	80.0	0.024
1.0	0.906	21.0	0.044	41.0	0.028	61.0	0.031	81.0	0.027
2.0	0.459	22.0	0.028	42.0	0.021	62.0	0.020	82.0	0.028
3.0	0.321	23.0	0.043	43.0	0.036	63.0	0.028	83.0	0.027
4.0	0.162	24.0	0.026	44.0	0.014	64.0	0.037	84.0	0.024
5.0	0.158	25.0	0.041	45.0	0.034	65.0	0.032	85.0	0.020
6.0	0.122	26.0	0.023	46.0	0.028	66.0	0.021	86.0	0.015
7.0	0.101	27.0	0.040	47.0	0.019	67.0	0.024	87.0	0.010
8.0	0.094	28.0	0.024	48.0	0.035	68.0	0.034	88.0	0.006
9.0	0.068	29.0	0.037	49.0	0.019	69.0	0.036	89.0	0.002
								90.0	0.000

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MECHANICAL SPECIFICATIONS



Proposal No. **C-71029-3**
 Date **26-Feb-20**
 Call Letters **WTTG**
 Channel **36**
 Frequency **605 MHz**
 Antenna Type **TFU-32ETT/VP-R O6**

Preliminary Specifications

Top Mounted

With ice TIA-222-G

Height AGL(z) 680 ft (207.3 m)
 Basic Wind Speed 90 m/h (144.8 km/h)

Structure Class II
 Exposure Category C
 Topography Category 1

Design Ice 0.5 in $t_{iz} = 1.35$ in
 Wind Speed w/Ice 40 m/h (64.4 km/h)

Mechanical Specifications

		without ice	with ice	
Height with Lightning Protector	H4	59.6 ft (18.2m)		
Height less Lightning Protector	H2	55.6 ft (16.9m)		
Height of Center of Radiation	H3	27.8 ft (8.5m)		
Effective Projected Area	(EPA) _S	63.2 ft ² (5.9m ²)	146 ft ² (13.6m ²)	from flange base
Moment Arm	D1	29.4 ft (9m)	30.1 ft (9.2m)	

Weight W 6000 lb (2.7t) 8500 lb (3.9t)

Antenna designed in accordance with AISC specifications for design of structural steel as prescribed by TIA-222-G

Prepared by: JBC Date: 2-Nov-17 ME: EE:
 Rev. No.3 by: SPJC Date: 26-Feb-20

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Summary

Proposal No. **C-71029-4**
Date **9-Jul-20**
Call Letters **WTTG**
Channel **36**
Frequency **605 MHz**
Antenna Type **TFU-32ETT/VP-R 06**

Antenna

	Hpol	Vpol
ERP:	1,000 kW (30.00 dBk)	500 kW (26.99 dBk)
RMS Gain*	18.60 (12.70 dB)	9.30 (9.68 dB)

Antenna Input Power **53.8 kW (17.30 dBk)**

Transmission Line

Type: **Rigid** Attenuation: **(0.70 dB)**
Size: **8-3/16"** Efficiency: **85.2%**
Impedance: **75 Ohm**
Length: **780 ft 237.7 m**

Mask Filter

Attenuation (0.25 dB)
Efficiency 94.5%

Transmitter Output

66.8 kW (18.25 dBk)

Transmitter filter losses included

* Directivity and Gain are with respect to half wave dipole. The gain includes feed system losses

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