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Mr. John Barber
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re: Technical Evaluation Data, Preventor System 2005A

Dear John:

Thanks for providing me with the test data on the Preventor 2005A Lightning Protection System, which you have recently installed on my home under construction. It helped me to understand the operating principle of this system, as compared to the conventional Franklin-type lightning rods.

I have made up the enclosed spreadsheet, showing data for an extended number of values of the striking current, and using the value for the constant "K" of 0.37, which as best I could understand, was the characteristic they determined for your product in the testing laboratory. The similar table, Table 2, of the data you gave me, was done for a value of K = 0.25.

I have assumed, consistent with our discussions, that the height "h" is to be considered as the length of the mast on the Preventor, not the height above the ground, though I would imagine that results in the field would be better as height above the ground increases.

The formulas are in meters, but I have converted the Rp results to feet.

As can be seen from the table, the radius of protection is substantially greater for the E.S.E. Terminal (Preventor) than for one Franklin Rod. In practice, as you know, Franklin systems use multiple rods.

It is also clear that the radius of protection depends on the severity of the lightning strike - the leader current in thousands of amperes, increasing with the severity of the strike. According to Table I of the data you supplied, the statistical frequency of strikes decreases with increasing leader current. I was not able to fully understand this relationship from the test data given, as no mathematical formulas for this were included. Also, Table I, and hence my calculations, were for values of "I" which were defined as "Low-intensity Lightning", but it was not clear how these values would compare with field conditions encountered in Southwest Florida. If any further information about that is available, I would like to see it.

If you wish, you may use this letter and the table to inform your customers about the features and capabilities of the Preventor system, but with the following disclaimer: I have worked as an engineer at Cape Canaveral for thirteen years, and have degrees in electrical engineering and mathematics, but I am in no sense an expert on lightning protection. I have constructed the enclosed spreadsheet based solely on the data you gave me and my understanding of it.

As you have advised me, any lightning protection system has its limitations, and there can be no guarantee that damage will not occur. By the same token, when damage does not occur in a particular storm, one cannot be sure if the protection system worked, or if luck was with us. That said, I can tell you that the storm we had last Wednesday was <u>intensely</u> electrical, and no damage was noted.

Please let me know if my understanding of the system and how it works seems incorrect. If additional testing or analysis becomes available, I would like to see it.

Thanks for your prompt and courteous service.

Sincerely,

Peter C. Ray

encl: data sheet

COMPARISON OF RADIUS OF PROTECTION
PREVENTOR" EARLY STREAMER EMISSION TERMINAL
VS. CONVENTIONAL FRANKLIN ROD

(AMPS x 1000) A' CURRENT	D" (FRACTAL MODEL) STRIKING DIST(M.)	DELTA L = K x D (K = 0.37)	Rp = RADIUS OF PROTECTION E.S.E. IN FT.(h=6FT)	RADIUS OF PROTECTION. FRANKLIN ROD. IN FT (h=6FT)
2	15.69	5.81	54.37	25.15
3	20.42	7.56	69.09	28.92
4	24.62	9.11	82.10	31.89
5	28.47	10.53	93.97	34.39
6	32.05	11.86	105.03	36.56
7	35.43	13.11	115.44	38.50
8	38.64	14.30	125.34	40.26
9	41.71	15.43	134.81	41.87
10	44.67	16.53	143.92	43.36
11	47.52	17.58	152.71	44.76
12	50.29	18.61	161.22	46.07
13	52.97	19.60	169.48	47.30
14	55.59	20.57	177.53	48.48
15	58.14	21.51	185.37	49.60
16	60.63	22.43	193.03	50.67
17	63.07	23.33	200.53	51.69
18	65.45	24.22	207.87	52.68
19	67.79	25.08	215.07	53.63
20	70.09	25.93	222.14	54.54
21	72.35	26.77	229.08	55.43
22	74.57	27.59	235.91	56.28
23	76.76	28.40	242.64	57.11
24	78.91	29.20	249.26	57.92
25	81.03	29.98	255.78	58.70