

Errors in Insulation Coordination for Power Systems, Andrew R. Hileman

March 2, 2000

These are the more important errors that I have found when teaching from this book. Only Chapters 1 to 10 are included. Did look quickly at Chapters 11-13. I'm sure there are more. When you find them send them to me.

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1. Page 17, following equation 8, change grams per liter to grams per m³
2. Page 21, equation 20 should be

$$CFO_S = \frac{BSL_S}{1 - 1.28 \sigma_f / CFO_S} = 1153 \text{ kV}$$
$$BSL_A = 0.90^{0.3782} (1050) = 1009 \text{ kV}$$

3. Page 44, Figure 19 should be

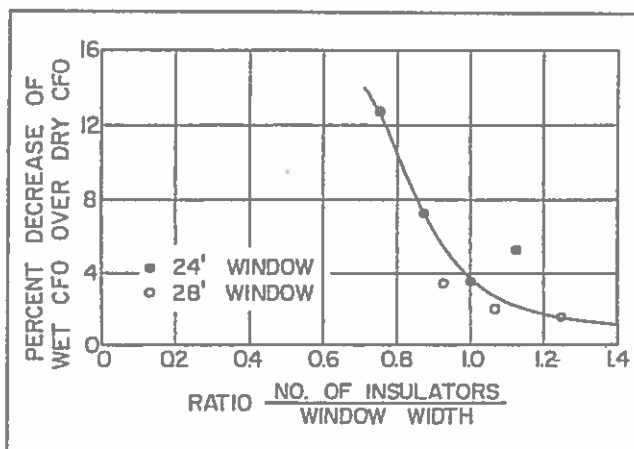


Figure 19 Effect of wet conditions [17]

4. Page 81, equation 65, CFO should be CFO_s

5. Page 86, sage should be sag

6. Page 122, equation 88, should be

$$A_L = S_H + r + L \sin \alpha_S$$

7. Page 187, equation 71, should be

$$K_{cs} = \frac{BSL}{E_2}$$

8. Page 189, equation 73, should be

$$F_1 = \frac{1}{2-\sqrt{2}} \left[1 - \frac{\sqrt{1+K_L^2}}{1+K_L} \right] \quad F_2 = \frac{1}{2-\sqrt{2}} \left[2 \frac{\sqrt{1+K_L^2}}{1+K_L} - \sqrt{2} \right]$$

9. Page 189, equation 75, should be

$$BSL_p = \frac{2 BSL_o}{1+K_L}$$

10. Page 204, Figure 7, the illustrations for the positive upward and positive downward flash should be switched

11. Page 247, top of page, change β to 2β

12. Page 310, table under problem 3, second line should have "y, ft" of 34 instead of 45

13. Page 336, Figure 26, change equation on lower portion of curve to agree with equation 66, i.e.

$$1 + \frac{2 ST_T}{n E_A}$$

14. Page 341, equation 78, change N to n

15. Page 342, equation 81, change 400 to 404 and answer to 6.70 kA. Change equation 82 to agree with this.

16. Page 398, sentence before "11 A Sensitivity Analysis" should be
"By computer program: CIGRE method: 13.2 flashover/100 km-yr, a 17% error"

17. Page 410, equation 51, should be

$$P(I > I_c) = \frac{1}{1 + (I_c/31)^{2.6}}$$

18. Page 491, 5th line, 8700 kV should be 870 kV

Errors in Insulation Coordination for Power Systems, Andrew R. Hileman

December 7, 2000

These are the more important errors that I have found when teaching from this book. Only Chapters 1 to 10 and 15 are included. Did look quickly at Chapters 11-13. I'm sure there are more. When you find them send them to me.

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Chapter 1 pp 1-30

1. Page 13, last line should read, "For comparison, the insulation characteristic of Fig. 7 is plotted linearly in Fig. 8
2. Page 10, Table 4, under Transformer bushings, BIL, change 50 to 550
3. Page 17, following equation 8, change grams per liter to grams per m³
4. Page 21, equation 20 should be

$$CFO_S = \frac{BSL_S}{1 - 1.28 \sigma_f / CFO_S} = 1153 \text{ kV}$$
$$BSL_A = 0.90^{0.3782} (1050) = 1009 \text{ kV}$$

5. Page 28, after equation 29, change per liter to per m³

Chapter 2 pp 31-88

1. Page 44, Figure 19 should be as shown on next page
2. Page 69, missing decimal point, should be
Breakdown voltage at 2 μ s = 1.67 (CFO)
3. Page 81, equation 65, CFO should be CFO_s
4. Page 86, after the tables, sage should be sag

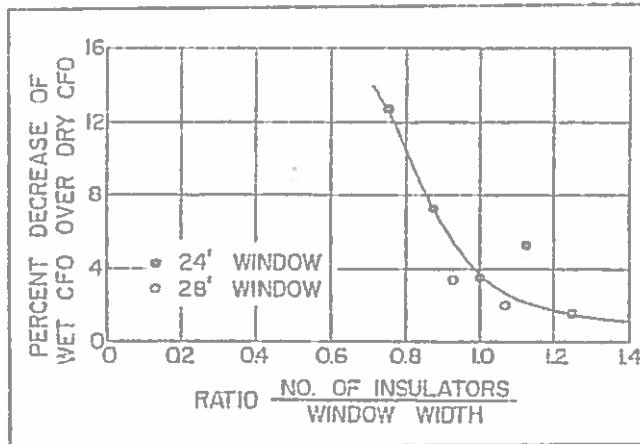


Figure 19 Effect of wet conditions [17]

Chapter 3 pp 89-134

1. Page 120, first equation 83, y_3 should be y_e
2. Page 122, equation 88, should be

$$A_L = S_H + r + L \sin \alpha_S$$

Chapter 4 pp 135-162

1. Page 135, first sentence, should be, "As for phase-ground insulation etc"
2. Page 155, equation 52, change σ_{FG} to σ_{FP}

Chapter 5 pp 163-193

1. Page 168, Table 4, exchange column headings of BIL & BSL
2. Page 185, equation 64, change BsL_p to BSL_p
3. Page 186, equation 68, should be

$$CFO_{cs} = k_g \frac{3400}{1 + (8/S_p)}$$

4. Page 187, equation 71, should be

$$K_{cs} = \frac{BSL}{E_2}$$

5. Page 189, equation 73, should be

$$F_1 = \frac{1}{2-\sqrt{2}} \left[1 - \frac{\sqrt{1+K_L^2}}{1+K_L} \right] \quad F_2 = \frac{1}{2-\sqrt{2}} \left[2 \frac{\sqrt{1+K_L^2}}{1+K_L} - \sqrt{2} \right]$$

6. Page 189, equation 75, should be

$$BSL_p = \frac{2 BSL_o}{1+K_L}$$

Chapter 6 pp 195-240

1. Page 204, Figure 7, the illustrations for the positive upward and positive downward flash should be switched
2. Page 211, Table 4, erase notes under Table 4
3. Page 213, Figure 11, Vertical axis should be, "P[I≤I_p], %"

Chapter 7 pp 241-274

1. Page 247, top of page, change β to 2β
2. Page 250, 2nd line under section 3.5, should be "setting I_m to I_c"
3. Page 251, 3rd line under equation 27 should be "r_g < (h+y)/2"

Chapter 8 pp 275-312

1. Page 310, table under problem 3, second line should have "y, ft" of 34 instead of 45

Chapter 9 pp 313-372

1. Page 325, equation 32, second line should be

$$= \left[\frac{R_i Z_E}{Z_E + 2R_i} + \alpha_T Z_T \frac{T_T}{t_f} \right] I = \left[R_c + \alpha_T Z_T \frac{T_T}{t_f} \right] I$$

2. Page 325, equation 33 should be

$$K_{TT} = R_c + \alpha_T Z_T \frac{T_T}{t_f}$$

3. Page 326, equation 35, first part should be

$$V_R = \frac{R_i Z_T I}{Z_T + R_i}$$

4. Page 336, Figure 26, change equation on lower portion of curve to agree with equation 66, i.e.

$$1 + \frac{2}{n} \frac{ST_T}{E_A}$$

5. Page 341, equation 78, change N to n

6. Page 342, equation 81, change 400 to 404 and answer to 6.70 kA. Change equation 82 to agree with this.

Chapter 10 pp 373-460

1. Page 398, sentence before "11 A Sensitivity Analysis" should be "By computer program: CIGRE method: 13.2 flashover/100 km-yr, a 17% error"

2. Page 410, equation 51, should be

$$P(I > I_c) = \frac{1}{1 + (I_c/31)^{2.6}}$$

Chapter 11 pp 461-495

1. Page 491, 5th line, 8700 kV should be 870 kV
2. Page 493, change equation 73 to

$$V_s = I_s R_i (1-C)$$

2. Page 493, equation 74, change 2nd part of the equation to

$$V_s = (1-C)(V_{TT} + V_{PF}) = (1-C)(IR_c + V_{PF})$$

5. Page 493, equation 75, change 2nd equation to

$$S = \frac{K_c}{d_m + L_{sp}} \quad \tau = \frac{Z_g}{R_i} T_s$$

where L_{sp} is the span length.

On the next line change R_o to R_i and delete, "The length of the line is set at 300 m, i.e. not d_m ."

6. Page 495, reference 7, change to pp. 1005-1014

Chapter 12 pp 497-556

1. Page 511, equation 9, add $-4 \leq Z \leq \infty$
2. Page 539, change $\text{Min.TOV}_{10} = 1.24(\text{MCOV})$ to $\text{Min TOV}_{10} = 1.30(\text{MCOV})$
3. Page 540, equation 66, change to:

$$\text{MCOV} = \frac{1.6(7.33)}{1.30} = 9.0 \text{ kV}$$

Chapter 13 pp 557-640

1. Page 563, equation 4, should refer to Table 5 for K_2

2. Page 571, equation 20 should be

$$\frac{E_J}{E_A} = 1 + \frac{A}{1 + (B/K_1)}$$

3. Page 571, equation 22 should be

$$E_B = E_A + 2S(T_B + T_A)$$

4. Page 590, equation 61 should be

$$\begin{aligned} BSL &= (SF) E_d \\ BIL &= \frac{SF}{0.83} E_d \end{aligned}$$

5. Page 618, equation 141 should be

$$\begin{aligned} BSL &= (1.20) E_d \\ BIL &= \frac{1.20}{0.83} E_d \end{aligned}$$

6. Page 618, equation 143 should be

$$BIL = \frac{E_b}{1.15 \delta} \quad \text{if } E_b/E_d > 1.15$$

Chapter 15 pp 677-700

1. Page 681, equation 8 should be

$$dP = 2N_g L (X_m - D_g) f(I) dI$$

2. Page 684, Fig. 8, "Grd Wire or Neutral" is lower conductor and "Conductor" is upper conductor.

3. Page 688, equation 19, change r_{cT} to r_{c1}

4. Page 690, sentence above equation 28, make same changes per above item 3.
5. Page 692, Fig 14 captions, add to (b) $h_T=10$
6. Page 692, next to last line, change h_t to h_T
7. Page 693, equation 31, change r_g to r_g

April 18, 2001

