Energy Systems Engineering Errata

First posted 7/16/08
Last updated 2/9/09

We recommend that you check

http://www.lightlink.com/francis/EnergySystemsEngineeringErrata.pdf

to see if a more recent version of the errata is available.

A second pressing of the book appeared in January 2009. Many of the errata below are corrected in the second pressing, however we are keeping a cumulative list as a service to readers who are in possession of the first pressing.

Chapter 1

p.21, Prob.1-3. Add the following data: "the adult literacy rate is 75%." Also, the figure reference should refer to Figs. 1-2 and 1-3, not 1-4 and 1-5.

Chapter 6

p.146, Fig.6-10: numbering of points 9 and 10 is reversed
p. 146-147. The following changes should be made to Example 6-9 due to reversed numbering of pumps 1 and 2:
"m9=0" should be changed to "m10=0"
"m11 =m10" should be changed to "m11=m9"
"Pump work for pump 1 is ....." should be changed to "Pump work for pump 2 is ....." since there is no flow through pump 1.
In the next line WP1 should be changed to WP2.
For Case 2 on p.147, the following changes should be made:
"m9=3" should be changes to "m10=3".
"m10=10.5+1.5=..." should be changed to "m9=10.5+1.5=...".
p.163, Prob. 6-8: should be steam enters turbine at 500 Degrees C
p.164, Prob.6-11: typo, change "or" to "of", i.e. should read "the project life is 20 years with an MARR OF 3%.

Chapter 7

p.165, units for CO_2 are in tonnes of carbon equivalent. Therefore the first sentence in Section 7-2 should read "In 1994, worldwide CO_2 emissions, measured in tonnes of carbon equivalent, surpassed…etc."

Chapter 9

p.244, eq.9-27 should be corrected as follows:

$$\overline{R_b} = \frac{\cos(L-\beta)\cos(\delta)\sin(\omega_s') + \omega_s' \sin(L-\beta)\sin(\delta)}{\cos(L)\cos(\delta)\sin(\omega_s) + \omega_s \sin(L)\sin(\delta)}$$

p.246. Prob.9-3. The problem refers to 9 AM solar time, i.e., the fifth sentence should read "On the summer solstice…on the device at 9 a.m. solar time?" Note the misspelling, should be "solar" not "solor".

p.247, add the following sentence to the end of Exercise 9-8: "Assume both the local and standard longitudes are 90W."

Chapter 12

p.347. Table 12-3. The column headed "Power [kW]" as given underreports the power value as a function of bin number. The corrected table, with changes to this column and the "Energy (1000 kWh)" column, is the following. As a result, the output value at the top of p.348 should refer to "the AEO value of 5.8 GWh", and the capacity factor on the same page should be 44.4%, not 0.404. Below the capacity factor calculation, the parenthetical phrase should read "…than the 44% value above.)"

Bin	Min	max	Bin avge.	Frequency	Power	Energy
	[m/s]	[m/s]	[m/s]	[hours]	[kW]	[1000 kWh]
1	0	3	n/a	780	0	0
2	3	4	3.5	537	14	8
3	4	5	4.5	672	60	40
4	5	6	5.5	807	155	125
5	6	7	6.5	836	269	225
6	7	8	7.5	833	420	350
7	8	9	8.5	831	625	519
8	9	10	9.5	685	900	616
9	10	11	10.5	579	1195	692
10	11	12	11.5	473	1395	659
11	12	13	12.5	366	1485	544
12	13	21	17	1359	1500	2039
13	21	and above	n/a	2	0	0
			Total	8760		5816

p.351, Eq.12-14 third line should read $U_2 = U_1(1 - a)$.
p.352, Eq.12-20: "+" should be changed to "-", $C_p = 4a^3 - 8a^2 + 4a$.
p.353, Eq.12-21: "4" should be changed to "2", $T = 2\rho A_2 a U^2(1 - a)$.
p.358. 4th paragraph, 1st sentence, eliminate V_r from the sentence, i.e., "The magnitude of dT is then the force acting on an area…" etc.
p.360, Eq. 12-38: sign in denominator of equation should be "+", not "-". Thus the equation becomes:

$$C_L = 4\sin\phi(\cos\phi - x\sin\phi)/[\sigma'(\sin\phi + x\cos\phi)] \qquad (12\text{-}38)$$

p.360, Example 12-5, answer should be $C_{P,max} = 0.3747$. The sentence at the end of the Example should then read "The approximate value from eq.12-39 at $\lambda = 5.75$ is somewhat lower than the maximum power coefficient seen in Fig.12-11 of 0.489 at 9.5 m/s, suggesting that the turbine in the figure may have a lower C_D/C_L ratio."
p.361, Example 12-6: similarly to eq.12-38 on p.360, change sign in denominator to "+". Once this correction is made, the calculation will give the correct value of $C_L = 1.241$.
p.369. Exercise 12-3, should refer to Fig.12-11, not 12-7.
p.369. Exercise 12-5, part a), sub-part (iv), change "*CP*" to "C_P", i.e., power coefficient.
p.369. Exercise 12-6, should refer to Table 12-6, not Table 12-5.

Chapter 13

p.403, 4th full paragraph from the top, "ethanol production in temperature regions...", "temperature" should be replaced with the word "temperate".
p.419, Prob. 13.1: rolling resistance should be $C_o = 0.01$, not $C_o = 0.1$ as written.
p.420, prob. 13-5: reference voltage for fuel cell at 80 °C is $E_0 = 1.18$ V.

Chapter 15

p.475, Fig.15-3: the distance along the penstock pipe should be 1700 ft., not 17 ft.