

## ERRATA AND ADDITIONS FOR "ENGINEERING NOISE CONTROL"

5th Edn. First printing

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- p21, Figure 1.4, change the  $X$  on the axis labels to  $A$ .
- p24, two lines under Figure 1.5, the expression,  $e^{j\omega t + \beta}$  should be  $e^{j(\omega t + \beta)}$ .
- p26, Equation (1.63), replace  $p_{rms}$  with  $p_{RMS}$
- p71, Near the bottom of the page, items labelled 1 and 2 should be items (a) and (b).
- p138, Line following Equation (3.10), the correct units of dynamic viscosity are N-s/m<sup>2</sup>.
- p138, Equation (3.13) should be  $C_c = V_c / (\gamma P)$
- Ch4, In numerous places, replace  $Q_{rms}$  with  $Q_{RMS}$
- p178, 8<sup>th</sup> line following Equation (4.32), replace  $D_{rms}$  with  $D_{RMS}$
- p198, Figure 4.15 caption, change "Equation (4.113)" to "Equation (4.121)" and "Equation (4.112)" to "Equation (4.120)".
- p219, Replace the first sentence in the second paragraph following Table 4.5, with "A more accurate method of determining  $\Delta_1$  is to measure the average sound pressure level on two imaginary test surfaces surrounding the machine, which correspond roughly to the shape of the machine."
- p230, line above Equation (5.18), change "Equation (5.13)" to "Equation (5.15)".
- p232, Add the following text after the paragraph following Equation (5.33). Note that this addition and all the changes on pages 232-234 are for clarification and simplification only.

The calculation of  $g(w)$  is a complicated process and the equations to follow can only be used in isolation if the real part of  $w$  is less than 0 and the imaginary part is greater than 0 (that is,  $w$  is in the second quadrant of the complex plane). So any calculation begins with adjusting the value of  $w$  to  $w_a$  so that the real part is less than 0 and the imaginary part is greater than 0. As  $w_a$  is complex, we can write,  $w_a = w_r + jw_i = \text{Re}\{w_a\} + j \text{Im}\{w_a\}$ . The calculation of  $g(w_a)$  is then undertaken using Equations (5.33) to (5.42). If the original value of  $w$  did not need be adjusted to put  $w$  in the second quadrant of the complex plane, then  $g(w) = g(w_a)$ . If the original value of  $w$  before adjustment, was such that  $w$  was not in the second quadrant of the complex plane, then  $g(w_a)$  must be adjusted to obtain  $g(w)$ , according to the following rules, with rule 1 applied first and rule 3 applied to the result after the application of rules 1 and 2.

1. If the imaginary part of  $w$  is less than 0, then  $g(w_a)$  is replaced with

$g(w) = 2\exp(-w_a^2) - g(w_a)$ , where  $g(w_a)$  is calculated using Equations (5.33) to (5.42);

2. If the imaginary part of  $w$  is greater than or equal to 0, then  $g(w) = g(w_a)$ ;
3. If the product of the imaginary and real parts of  $w$  is greater than 0, then the sign of the imaginary part of  $g(w_a)$  is changed (i.e., the complex conjugate of the  $g(w)$  that was obtained using the preceding two rules is then the final  $g(w)$ ).

p232, Replace Equation (5.34) with the following

$$g(w_a) = g(w_r, jw_i) = K_1(w_i, w_r) + jK_2(w_i, w_r)$$

p233, add " $g(w_a) =$ " to the left hand side of Equations (5.41) and (5.42).

p233, In Equations (5.41) and (5.42), replace  $w$  with  $w_a$ .

p233, Remove the paragraph following Equation (5.42) and item 1 following this paragraph.

p234, Remove item 2 from the top of the page.

p234, Remove the paragraph following Equation (5.46) and items 1 and 2 that follow this paragraph. Replace with the following text.

Unlike the first calculation method (Equations (5.34) to (5.42)), the preceding calculation method (Equations (5.43) to (5.46)) returns the correct value of  $g(w)$  for values of  $w$  in any quadrant of the complex plane, without the need for different procedures that are dependent on which quadrant  $w$  is in.

p234, At the beginning of the paragraph preceding Equation (5.47), replace  $w = nh$  with  $\text{Re}\{w\} = nh$ .

p235, Delete the first paragraph.

p235, Second paragraph, replace  $w = (n + \frac{1}{2})h$  with  $\text{Re}\{w\} = (n + \frac{1}{2})h$ .

p236, Delete the last sentence in the paragraph following Equation (5.58).

p247, Figure 5.3, vertical axis should be labelled, "Wind shear coefficient,  $\zeta$ ".

p247, Table 5.5 caption, change "empirical" to "wind shear".

p249, Third line after Equation (5.89), replace "lower" with "higher".

p250, In Equation (5.95), replace " $h_0/z_0$ " with " $h_0/z_0 + 1$ ".

p259, Include the following immediately before Section 5.3.4.5. "Calculation of the location of the reflection point is needed in order to find the length of the reflected wave path from the source to the receiver. Calculation of this location requires the solution of a cubic equation and is discussed in Appendix D in the book, Wind Farm Noise by Hansen, Doolan and Hansen (ISBN 9781118826126). Once this location is found, the angle at which the reflected wave leaves the source and its path length can be found

using the same techniques as for the direct wave. The path between the source and reflection point is analysed by treating the reflection point as a virtual receiver, while the path between the reflection point and the actual receiver is analysed by treating the reflection point as a virtual source.”

p279, Table 5.12 caption, change “Category 4” to “Category D”.

p367, line following Equation (7.10), replace  $z_n$  with  $z_i$

p375, In Equation (7.24), change  $C_1$  to  $C_I$

p382, In Equation (7.51), remove “1+”

p422, In Equations (7.125) and (7.128), there should be an additional “(“ following the “/” in the last term.

p434, In equations (8.31) and (8.32) and on the line between them “Re” should be in italics font as it represents the Reynolds number, not the real part of a complex number.

p494, 7 lines under Equation (8.233),  $2h/\ell$  should be  $2h/\lambda$ .

p520, 2 lines from the bottom of the page, change  $2\pi$  to  $\pi$

p 523, Equation (8.286) should be:

$$w(\varphi) = \left( \frac{\sin(ks_d \sin(\varphi))}{ks_d \sin(\varphi)} \right)^2 (1 - \alpha_{st})^{(L/2d)\tan|\varphi|}$$

p529, 1 line and 6 lines above Equation (9.1), replace  $F$  with  $\hat{F}$ .

p529, 4 lines above Equation (9.1), replace  $y_1$  with  $\hat{y}_1$ .

p530, Figure 9.1, replace  $F$  with  $\hat{F}$  and  $y_1$  with  $\hat{y}_1$ .

p531, In equation (9.8) and in the two lines immediately following it, and in Equation (9.9), change  $u_m$  to  $v_m$

p532, line under Equation (9.16), replace  $F$  with  $\hat{F}$ .

p556, Replace equation (9.77) with  $L_v = 20\log_{10}(v/v_{\text{ref}}); \quad v_{\text{ref}} = 10^{-9}\text{m/s} \quad (9.77)$

p568, In the line above equation (10.2), change  $\delta P_t$  to  $\Delta P_t$ .

p587, 2 lines above equation (10.58), remove “Howe and”.

p599, Equation (10.97) should be  $L_w = N_R + 10\log S + C$ .  
and values of  $C$  for each octave band are listed in the following table.

Octave band centre frequency (Hz)	Octave band corrections (dB)		
	Location 1 <sup>a</sup>	Location 2 <sup>b</sup>	Location 3 <sup>c</sup>
31.5	-1	-1	-1
63	5	8	8
125	7	13	13
250	2	8	12
500	2	8	12
1000	-4	-1	6
2000	-9	-9	1
4000	-14	-14	-4
8000	-21	-21	-11

<sup>a</sup> Outdoors, or indoors in a large mechanical room with a large amount of mechanical equipment.

<sup>b</sup> Indoors in small rooms, or large rooms with only a small amount of other equipment.

<sup>c</sup> Any critical location where a problem would result if the transformer should become noisy above its NEMA rating, following installation.

p601, The constant on the RHS of Equation (10.102) should be 74.9 and the constant on the RHS of Equation (10.103) should be 59.6.

p601, Equations (10.102) and (10.103) can be used for turbines with output powers greater than 200 kW.

p614, 4 lines from the bottom, change “track segment” to “train position”.

p614, line 5 under the heading, “Train Sound Power Levels”, delete the words “each track segment,”.

p615 In Equation (10.133),  $L_{24}$  is the total passing train length in a 24-hour period.

- p615, In Equation (10.135) delete one of the two  $\Delta L_c$  quantities on the RHS.
- p615, Following the three lines immediately after Equation (10.134), add the following:  
 “The calculation requires that the train length be divided into small segments and the sound pressure level at the receiver is then calculated for each segment (taking into account the segment length - see Equation (10.135). The total sound pressure level at the receiver in each octave band,  $i$ , is then calculated by logarithmically summing the contributions from all train segments that contribute significantly to the total  $L_{\max M, i}$  level. Also, the train position when undertaking the calculations for a particular receiver should be the one that results in the maximum overall  $L_{A, \max M}$  level at the receiver. Each receiver will have a different train position that results in the maximum  $L_{A, \max M}$  level.”
- p615, The track segment length is taken into account in Equation (10.135) by adding the term,  $10\log_{10}(L_{\text{track}})$  to the RHS, where  $L_{\text{track}}$  is the length of track in metres that is in the track segment under consideration.
- p615, The train length is taken into account in Equation (10.136) by adding the term,  $10\log_{10}(L_{\text{train}})$  to the RHS, where  $L_{\text{train}}$  is the length of train in metres that is in the train segment under consideration.
- p617, 1 line under the Geometrical Spreading heading, change “where  $-A_{\text{div}}$  is” to “where  $A_{\text{div}}$  is”
- p617, 1 line under the Atmospheric Absorption heading, change “where  $-A_a$  is” to “where  $A_a$  is”.
- p617, 3 lines under the Ground Effect heading, change  $\Delta L_g = A_g$  to  $\Delta L_g = -A_g$ .
- p617, Line above Equation (10.137), delete the sentence, “The maximum sound pressure level,  $L_{\max M, i}$ , in each octave band,  $i$ , is calculated using:”
- p617, Equation (10.137) should be  $\Delta h = d_1 d_2 / [16(d_1 + d_2)]$ .
- p618, In Equation (10.142),  $d_f$  is the distance from the facade to the receiver.
- p620, In Equation (10.144),  $L$  is the length of the track section occupied by the idling train.
- p620, Line above Equation (10.146), change “source line” to “source”.
- p620, Line immediately following Equation (10.146), change “source line” to “source”.
- p620, Last word in the paragraph following Equation (10.146), change “segment” to “section”.
- p620, 3 lines from the bottom, replace  $L_{W, 0, \text{idling}}$  with  $L_{W, \text{idling}, i}$ .

p622, first line, replace  $L_{W,0,idling}$  with  $L_{W,idling,i}$ .

p622, Table 10.39, in heading change “Electric multiple input” to “Electric multiple unit”.