Engineering Noise Control, Fourth Edition
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I am a noise control practitioner and as such, Bies and Hansen has been one of my favorite text books for some years now. It was Chapter 11, with sound power predictions for most common industrial equipment which first attracted me to the book. Industrial noise predictions are a common part of assessing the noise impact of new industrial facilities and it was great to find so much information on so many noise sources in one place. Not only are the common fans, motors and valves presented but also the less common items like boilers, turbines and generators. Also usually the prediction is based on simple to obtain information like power rather than things like rotational speed, which are harder to find out before a plant has been built.

Having made the investment, it was not long until I started looking through other chapters and they were almost invariably well written and helpful. Starting from fundamentals like sound intensity and sound power it moves through the human ear, instrumentation, criteria, outdoor propagation, indoor sound, barriers and several chapters on noise control. In many ways it reminds me of an updated version of Beranek's 1971 classic, "Noise and Vibration Control," which has been my bible since I started in the business. Interestingly I now give newcomers to the field Bies and Hansen to read in the same way my boss first introduced me to Beranek.

What finally clinched my allegiance was ENC, the software written by Colin Hansen and his one time graduate student Xiajun Qiu, now with The Institute of Acoustics at Nanjing University. This software, by their company, Causal Systems, automates practically every equation in the book. My experience with adapting equations from textbooks is that often something is missing or hard to interpret. Having the hard work done and many people besides me checking the results make for a very useful tool. It would be nice if one could copy an entire set of octave band results directly to a spreadsheet, but that is a quibble. The combination of software and textbook makes both more valuable.

What is more, Colin Hansen is quite accessible, considering he is half a world away. Several times I have had to contact him by e-mail and he invariably replies promptly and in a helpful manner.

So when I found out one of my favorite textbooks was into a 4th edition I was excited to take a look. The first edition was published in 1988, the second in 1996, third (the edition ENC is based on) in 2003 and the 4th in 2009. Eight, seven and now six years between editions begs the question: how much is changed?

The preface mentions new information on the mechanism of hearing loss in Chapter 2. This appears to be a single paragraph talking about free radicals and their buildup in the cochlea plus a statement that this might lead to an anti-noise pill. Chapter 4 on Environmental Noise is said to be updated and rewritten. This appears to be mainly done by adding an extra example and some other small changes.

The new chapter 12 is said to include a section on the practical application of various software packages including a free open source boundary-element-method package. I have always liked free stuff, so this was one of the first places I looked. It turns out the software was included for free as a CD in a book, which you have to buy. Google leads me either to the same reference or to a Beta test version which may be available by contacting the authors. I didn't pursue it further.

However, the section on duct or stack directivity in Chapter 9 is completely rewritten with both theoretical equations and field measurements provided. The latter are 2008 measurements from Day and Bennett in Australia. This is much more complete than the older version and I will probably use it on my next applicable project.

Chapter 8 on transmission loss, barriers, and enclosures does appear to have been expanded and rewritten in several areas. The structure, examples and figures are in many cases identical but new material has clearly been added in several sections.

The bottom line: If you don't already have Bies and Hansen and you work in the field of noise control then this should be high on your list of purchases. If you already have the 3rd edition, which is already very good, the choice will be much tougher unless you happen to need the latest information in one of the chapters where there actually are significant changes. Maybe hold out for the 5th edition? Perhaps buy the new and donate the old version to a recent graduate? Not an easy choice.

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