The old adage about not judging a book by its cover applies to not judging it by its title either. This massive tome (600 pages) covers safety the same way the SSA itself does - which is to say that it also addresses environment, industrial hygiene, occupational health, code compliance and some a bit of industry history thrown in as well. Another in the fine series of semiconductor related publications from Noyes, this book could easily be the foundation of a professional’s ESH library in the same way Van Zant’s Microchip Fabrication shows up on nearly every disciplines’ desk. The Semiconductor Safety Handbook is easily recommended to any beginner in the field, and all but the most senior experts will find useful information and guidance.

The Handbook starts with a look at occupational health and a bit of history. The position of the semiconductor industry in comparison to other industries incident and accident statistics is examined through some of the industries most well know epidemiological studies, including the DEC and UC-Davis reports. In light of recent court cases and media articles, this background is particularly useful, especially for the newer members of this industry.

The environmental chapter, which follows next, is the weakest portion of the book. Although entitled Environmental Compliance, the focus is almost entirely on self-auditing. Missing are any substantive discussion of air, wastewater, Superfund, hazardous waste or current environmental issues related to fab operations. The audit section does provide a useful checklist for those inexperienced in conducting audits. It also includes useful appendices on the Department of Justice sentencing guidelines and their influence in audit programs. Unfortunately, while the 1986 EPA Audit policy statement is included, the more recent EPA statement on audit privilege is missing, as is any discussion of state audit protection laws. The chapter would have also benefited from some discussion of the legacy issues from the early days of the industry, especially since those past sins are frequently raised by intervenor groups.

The chapters on chemical hazards and industrial hygiene provide are very informative. The chapter on chemical hazards provides an overview of the process steps and operations, including the chemicals found in each step, in well written easy to read style. The discussion of gases includes hazards, TLV values, and target organs of suspected carcinogens. The industrial hygiene discussion is in essence a summary, by the same authors, of the Semiconductor Industrial Hygiene Handbook. For those for whom this area is not their primary field, the discussion is very clear and concise. Topics covered even include issues in newer photo operations. For the practitioner, it provides useful tips on
where to sample, chemicals of interest, and tricks of the trade. The extended reference list of footnotes is also useful for further research on baseline studies. The inclusion of hypothetical qualitative assessments of acid etch and wave solder maintenance operations are nicely done. Not only do they provide a good example that is industry specific, but do so with two operations of sufficiently different levels of chemical hazards and exposure. The table of comparative information on photoresists is another good resource included in the chapter.

Individual chapters are devoted to electrical hazards, radiation safety, and plasma processing. The electrical hazard chapter is a good basic primer on electrical safety. It addresses most aspects of the fundamentals of electrical hazards and how to control them, including the physiological effects of shock and accident investigation. While useful and well presented, it lacks specificity to semiconductor operations and could almost be used verbatim for any industry. The chapter on radiation is either too short, or too ambitious in its scope. It attempts to cover extremely low frequency electromagnetic fields (ELF/EMF), radiofrequency/microwave radiation, ionizing radiation and lasers,... in only twenty pages. However, it has several useful tables in it, including magnetic filed levels near typical fab equipment, common RF/microwave frequencies of fab equipment, and a laser safety controls checklist for the various laser classes. These tables make it a good reference for the field. The plasma chapter is the one most centered on fab operations and as such is the best one of the book. After a quick review of process hazards and process hazard reviews, the chapter continues with a very useful discussion of plasma systems, processes, and by-product reactions. It concludes by looking at gas cabinets and gas systems safety, as well as toxicology issues. The information is clearly presented and well written.

The next major division of the book looks at fire protection and code compliance issues. They are excellent chapters for someone with no background in these disciplines. All aspects of fire protection technology are examined, from fab siting requirements, materials of construction, sprinkler systems and fire pumps, and chemical delivery/storage systems. Included in all of the discussions are references to the appropriate NFPA standards. The code chapter is equally well written and presented. Covering many of the same topics, it looks at the issues from the building code standpoint. Topics include H-6 requirements, egress, storage of HPM, and alarm systems, all with required citations. The charts on allowable material are included, as are several drawings showing typical code issues in designs. Individuals looking for a starting point on understanding this complex area would be well served to start here.

The final sections of the book discuss gases and gas handling and detection systems. All aspects of gas handling and delivery are covered. Mechanical considerations in design, piping and valving of delivery systems are discussed, along with code issues in storage quantities and safety monitoring. The discussion of toxic gas monitoring systems is clear and interesting, and useful to everyone who works in the industry. The various technologies used are examined, along with a discussion on considerations when selecting a system, including useful diagrams for monitoring point locations. Finally, this portion of the book presents chemical features,
physical properties, regulatory considerations, and process uses for most semiconductor gases from inerts to toxics. It is a useful compilation, although the format is a bit unwieldy.

In total, the Semiconductor Safety Handbook is a valuable resource for the industry, with everyone from ESH practitioners to fab operators able to find useful information. Those tasked with support to all aspects of ESH will find it a one-volume reference shelf, while everyone else will find some aspect, chapter or reference to assist them in their job.