

Industrial Hazards and Plant Safety

Sanjoy Banerjee, Taylor & Francis, New York, NY, 2003, 479 pp., US\$ 99.95, ISBN: 0-56032-069-9

Safety in chemical and industrial plants was the central topic when the *Journal of Hazardous Materials* was begun in 1975. It is even more important today even though we have added a second section entitled “Environmental Technology”. Chemical spills was the area of my expertise when I was appointed an editor of the journal that beginning year, but since then I have also acquired an interest in chemical plant accidents. I have read with much interest the publications of Trevor Kletz who has written many articles and books on safety in the chemical industry. One of these books is *Learn From Disaster—How Organizations Have No Memory and Accidents Recur*.

Banerjee, a chemical engineering professor at the University of California, Santa Barbara, goes deeply into the theory underlying chemical plant safety. He describes his approach this way: “Rather than covering all aspects of industrial hazards and plant safety, it [the book] focuses on developing and understanding of the risks associated with accidental events that impact design and operation in the process industries. In particular, it emphasizes transport processes in such problems, which is aligned with my own research interests”.

The book starts with descriptions of several notable accidents including the BLEVEs at Texas City, Texas in 1978 and San Juan Ixhuatepec, Mexico in 1984 and the concomitant devastation. No book on chemical hazards would be complete without a description of the release of methyl isocyanate at Bhopal, India. That toxic gas release in 1984 and the causes of it are discussed in some detail.

The introduction is followed by a discussion of qualitative hazard evaluation methods such as safety reviews, process/system checklists, relative ranking techniques, preliminary hazard analysis, “what if” analysis, hazard and operability studies, and failure modes, effects and criticality analysis. This chapter, in common with other chapters, is followed by an exercise section for students.

Banerjee notes that his choice of topics is somewhat oriented towards chemical engineering students’ needs but still should be of use to the practicing engineer. The problems he has supplied for student exercises, he notes, are generally open-ended and require some research as well as a standard computational package such as Mathematica.

From this point on, the material becomes very (theoretical) mathematical as one might expect from the chapter headings:

- Probabilistic hazard evaluation;
- Reaction hazards;
- Emergency relief systems;
- Treatment of emergency relief discharges;
- Explosions;
- Dispersion of releases;
- External fires and radiation;
- Vapor cloud explosions.

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