

Safety analysis: principles and practice in occupational safety. 2nd ed. By Lars Harms-Ringdahl. London: Taylor & Francis, 2001:302 p. ISBN: 0-415-23655-X.

If an enterprise or a safety official wants to improve the safety of an enterprise, the first task is to chart the hazards related to the work done by the enterprise. Of course, it is possible to walk through the enterprise and look for hazards. This method is not systematic, however, and many hazards are not detectable by observation if the observer does not have the proper background or expertise.

In this situation, the advantages of using a safety analysis become clear. A safety analysis furnishes a systematic view of the hazards in an enterprise. With the help of a safety analysis, it is possible to uncover hazards that are unobservable with the naked eye (eg, those related to chemicals). In some cases, the most difficult hazards to spot are those due to a combination of two or more hazards (eg, the reaction that occurs when two chemicals are mixed). A safety analysis offers the possibility to follow the safety of an enterprise over the long term.

The aim of *Safety Analysis: Principles and Practice in Occupational Safety* is to describe briefly the different methods used in safety analyses. Since the book describes about 50 methods, it is no exaggeration to call it a handbook on safety analyses.

The strength of the book is that it covers all meaningful methods used for safety analyses, for example, energy analysis, deviation analysis, and HAZOP. Both technical and human errors are included in the variety of methods.

One problem for the user of the book is to determine which method is applicable to the circumstances in the enterprise in question. The author of the book, Lars Harms-Ringdahl, has helped the reader in this respect by briefly describing the application area of every method. His descriptions show that he has used almost all of the methods included in the book.

He starts the book by discussing the accident problem. He presents data on the numbers of accidents worldwide. The results, however, are confusing. In the preface, he uses Jukka Takala's calculations from the International Labour Office to state that around 300 000 people are killed in occupational accidents each year. Later, on page 2, he refers to the estimation of Klesch that 180 000 fatal occupational accidents occur per year. No one knows the truth because of the existing differences in the definitions used for accidents and work and also because of the many different systems used to report accidents. It perhaps would have been clearer if he had used only one estimate.

One of the most important methods used in safety analyses is energy analysis. It starts by structuring the situation; it then proceeds by identifying energies and as-

sessing risks; finally it stops by offering suggestions that should help slow down hazardous energies. This is the procedure that is used in most safety analysis methods. The core of an energy analysis is a checklist on all energies that could affect workers.

Theoretically, the energy analysis is important because some definitions of an accident are based on hazardous energies. For example, Pekkarinen (1) defined an occupational accident as "an uncontrolled and unwanted condition of a work system called deviation or disturbance, where a *harmful energy* [reviewer's italics], substance or stress causes injury to a person [p 18]". In his book, Harms-Ringdahl has correctly mentioned that energy is one source of injury (p 55), but he has not shown the connection to the definition of an accident.

Safety function analysis is perhaps the author's favorite method, even though he did not express his opinion clearly. This method goes through the same procedure as an energy analysis: (i) structure the situation, (ii) identify and assess hazards, and (iii) propose safety measures. Perhaps its simplicity is the reason this method is favored. In half a day one can determine the main hazards of a workplace. However, an empirical comparison of the three methods energy analysis, deviation analysis, and safety function analysis did not show any one of the methods to be superior to the others (pp 275–282). Safety function analysis offers more suggestions on the action of management, whereas deviation analysis produces more suggestions on the control system, while energy analysis concentrates on the mechanical system. Thus the readers' choices of risk assessment methods influence the type of results they will obtain.

To conclude, *Safety Analysis: Principles and Practice in Occupational Safety* is the type of handbook on risk assessment methods that offers something about all the available methods, but does not give enough information to put them into practice. The book helps readers choose the right method, and the selection depends on their needs. Even if they are unsure about their selection, they can rest assured that using any systematic method is better than doing nothing.

References

1. Pekkarinen A. Occupational accidents occurring in different physical environments with particular reference to indoor and outdoor work. Oulu (Finland): University of Oulu, 1994:18. Acta universitatis ouluensis, C technica, no 80.

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