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Engineering safety assessment. J.R. Thomson. Longman, London, 1987, ISBN 0 582 41630 2, 222 pp, £10.95

This concentrated and useful book is intended as an introduction to the subject and is aimed at final year engineering students, postgraduate students and practising engineers or scientists becoming involved in risk assessment.

The subject matter is treated under five main headings: the theoretical basis of probability; systems reliability analysis; structural reliability; major industrial hazards; and probabilistic risk assessment. In each area all the essential

points are well covered, with plentiful allusion to the many interesting ramifications and alternative approaches open to those practising in this extensive field.

The author disclaims comprehensive coverage. However, he has managed to include a surprising amount of material in a clear economical style and the book will amply repay careful and thoughtful reading. Generally, clear warning is given when the treatment is restricted, with plentiful indications of where fuller treatment can be found by those whose appetites have been whetted or whose needs have been inadequately met.

Practical examples, both worked through in the text and for the reader to test his own understanding on, are a valuable feature of the book, together with a number of extracts from tables, physical and chemical properties and empirical correlations. Anyone working conscientiously through the text and examples should acquire a good general awareness of the problems, available techniques for their solution and the type of data encountered in assessing the full range of modern industrial hazards. Several photographs are well worth their inclusion, despite a certain fuzziness in reproduction.

A particularly apt feature is the inclusion of nuclear hazards alongside longer-standing hazards in industry at large, which should help to engender a better perspective in which to view and evaluate risks in general. There is some discussion of risk perception which, while exposing the double standards common in dealing with nuclear and non-nuclear risks, wisely avoids stridency or plaintiveness.

In view of the intended readership the

attention given to theoretical analysis and calculation is not misplaced. However, there may be a danger in building false confidence in the results, especially if read out of context. Nevertheless it is fair to note that the author, in several places, lays stress on the uncertainties lurking in hazard analysis and draws attention to instances where unrealistic conclusions may emerge. An omission is that of the part played by engineering judgement. The discussion of basic probability implicitly assumes a 'frequentist' approach, whereas in practice paucity of data always entails to a greater or lesser extent the exercise of technical judgement for which a 'subjectivist' approach to probability can provide a disciplined framework. Although lack of data is

singled out as the main source of deficiencies in risk analysis, little is said as to what is lacking and how the gaps can be filled. Fuzzy sets might also have deserved a mention.

The Chernobyl accident is mentioned, both in the text and in a note added in the proof. In conjunction with the contents list the index allows the user to locate a wealth of sound material on a wide range of topics quickly and efficiently. The bibliography is excellent.

In conclusion, the author has succeeded in his stated aim. Moreover the book is likely to prove a compact and valued guide even to experienced risk assessors, for example when turning their attention to unfamiliar technical areas.

HJT

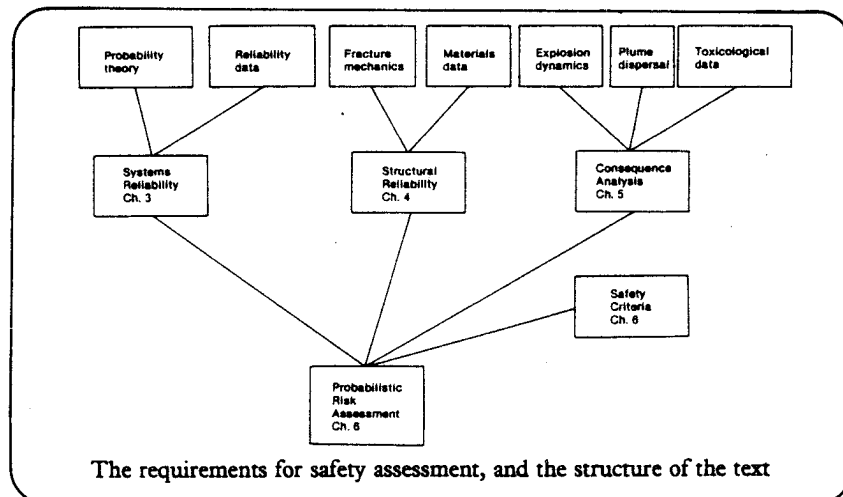
ENGINEERING SAFETY ASSESSMENT

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- ◆ *Consequence analysis, including the effects of explosions, the dispersal and toxicity of airborne chemicals and the effects of airborne radioactivity*
- ◆ *Ethical issues raised by risk assessment – the difficult question of 'acceptable risk'*

Engineering Safety Assessment will be invaluable for all senior undergraduate, postgraduate and practising engineers and scientists in the chemical, mechanical and nuclear industries.

0 582 41630 2 240 pages 234 × 156mm May 1987 £10.95 net

The Author

J R Thomson, BSc(Eng), PhD, CEng, MIMechE, MINucE, taught undergraduate and postgraduate courses in the departments of mechanical and chemical engineering and the unit of fire safety engineering at Edinburgh University. He was formerly a shift manager at the Prototype Fast Reactor power station at Dounreay in Scotland. He is now with the National Nuclear Corporation Ltd., Knutsford, Cheshire.

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