



# Risk in the Real World

## A New Guide to Analysis

People who assess risk for a living are beginning to recognize the need for new methods to match the complexity of some of the problems they must confront—say, for example, ascertaining the risk associated with thousands of chemicals at a nuclear waste or Superfund site. As the science advances, the rest of us need to understand at least superficially what risk assessors do and how their work affects our prospects for health and safety.

To help meet this need, there exists a new booklet called *Understanding Risk Analysis, A Short Guide for Health, Safety, and Environmental Policy Making*, which the American Chemical Society and RFF have jointly published. Publishing the booklet is part of the joint effort the two organizations have made to educate Congress about risk issues and to facilitate communication about the subject among the three branches of government.

The booklet traces the history of risk analysis—noting the relative newness in public debate of terms like risk analysis, risk assessment, and risk management. It points out, too, that professional risk assessors were on the job as long ago as 3200 B.C. offering advice on uncertain or difficult decisions in Babylon. It wasn't until early in this century, however, that serious scientific study began of the risk factors associated with certain technologies and substances. Development of this knowledge led to the use of a "no-observed-effect level" or "NOEL" to demarcate (sometimes misleadingly) the line between safety and danger.

NOEL is one of the foundational elements of contemporary quantitative risk assessment. When concerns turned to low-dose exposures to ionizing radiation and to potentially carcinogenic chemicals in the 1960s, however, this concept proved problematic: it wasn't possible to establish a no-effect threshold for such substances. This shortcoming prompted the Nuclear Regulatory Commission and the Food and

Drug Administration to search for ways to detect and quantify the risks of exposures to radiation and carcinogens in food.

Meanwhile, Congress' passage in the early 1970s of major environmental statutes, and its creation of the Environmental Protection Agency and the Occupational Safety and Health Administration, enlarged the role of risk analysis in the regulatory process and stimulated professionalization of the field.



Since that time, risk analysis has become a central component of the nation's policymaking regarding health, safety, and environmental quality.

From the beginning, the technique has been composed of a hybrid mix of disciplines pieced together to meet a policy need. Perhaps not surprisingly, then, risk analyses have been a source of controversy more than consensus, the booklet reveals. As the tool has become more important, the tensions surrounding its proper use

have risen and are expected to take years to resolve.

The difficulties are both scientific and political. Despite, for example, the aforementioned efforts of NRC and FDA, the current state of scientific understanding in the field is still not up to the task of answering important questions about the type and size of specific hazards. Neither is the field capable of answering questions about the acceptability of certain risks and how to balance trade-offs among competing interests, which are beyond the realms of technology and science in any case.

What ACS and RFF hope to accomplish by publishing the booklet is to acquaint readers with the strengths and limitations of risk analysis even as it grows in prominence. After all, it is part of the process of regulating a wide range of potential dangers, such as pesticide residues, food additives, pollutants in drinking water, and certain features of industrial processes and transportation equipment, to name but a few.

Ray Garant of ACS and Terry Davies of RFF supervised publication of the text written by Mark Boroush, formerly of the Congressional Office of Technology Assessment.

As part of their joint education effort, ACS and RFF also co-sponsored a series of talks on environmental risk for members of Congress and their staffs. The ACS Risk Education Project is funded by a grant from the Eastman Kodak Company. The Carnegie Corporation of New York supported RFF's co-sponsorship of project activities.



Download the booklet at [http://www.rff.org/misc\\_docs/risk\\_book.htm](http://www.rff.org/misc_docs/risk_book.htm). To order a hard copy, contact the ACS by telephone (202-872-4386) or e-mail ([risk@acs.org](mailto:risk@acs.org)). The first ten copies ordered are free; additional copies cost \$2.00.