United States
Environmental Protection
Agency

Office of Information
Resources Management
Washington DC 20460

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EPA

Risk Assessment, Management, Communication

A Guide to Selected Sources
Third Update

Risk Assessment, Management, Communication

A Guide to Selected Sources: Third Update: October 1987

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* Indicates that no references were found for this section.

This third update to the Guide has been prepared and reviewed by the U.S. Environmental Protection Agency (EPA). Due to the rapidly expanding field of risk information, EPA cannot guarantee that all relevant sources are cited. Publication does not signify that the contents reflect the views of EPA or that EPA endorses the coverage and scope of the subject matter as comprehensive, complete, and appropriate.

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Due to funding limitations, we may have to restrict distribution of future updates to Federal and State agencies only. However, copies may be obtained from NTIS.

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INTRODUCTION

This third quarterly update to Risk Assessment, Management, Communication: A Guide to Selected Sources contains references gathered from the following databases: Toxline, Conference Papers Index, ENVIROLINE, National Technical Information Service (NTIS), Public Affairs Information Service (PAIS), ABI Inform, and Legal Resource Index. The citations cover the period of July 1987. Beginning in January 1988, updates to the Guide will be produced twice a year.

The risk update series is subdivided into three major sections: Assessment, Management, and Communication. Consult the Table of Contents for the categories included in each major division. The citations are arranged alphabetically by title. The Chemical Specific Risk Assessment and Chemical Specific Risk Management subsections are grouped by chemical name. Abstracts in the Assessment section have been shortened or eliminated if the content of the article is reflected in the title.

The EPA library network can assist EPA staff and EPA contractors in obtaining materials. Reference copies of the Guide and its updates are available at all EPA libraries. For those outside of EPA, the Guide and updates are available through NTIS at the following address:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
703-487-4650

Guide: PB87-185500
1st Update: PB87-203402/AS
2nd Update: PB88-100102

Questions or comments concerning the Guide or updates can be sent to:

Headquarters Library, PM-211A
Risk Update
U.S. EPA
401 M Street, S.W.
Washington, D.C. 20460

RISK ASSESSMENT

.... IS THE SCIENTIFIC PROCESS THAT EVALUATES THE POTENTIAL FOR OCCURRENCE OF ADVERSE EFFECT.

QUANTITATIVE RISK ASSESSMENT AND PHARMACOKINETICS .... includes cinical and physiological pharmacokinetics, drug metabolism, acceptable daily intake (ADI), quantitative structure-activity relationship (QSAR), dose-response relationship.

Interspecies Dosimetry of Reactive Gases
Miller, F. J. ; Overton, J. H. ; Gerrity, T. R. ; Graham, R. C.
Health Effects Research Lab., Research Triangle Park, NC.
Corp. Source Codes: 048097000
Sponsor: Northrop Services, Inc., Research Triangle Park, NC.
Report No.: EPA/600/D-87/105
PB87-175824/XAB
Mar 87 36p
Prepared in cooperation with Northrop Services, Inc., Research Triangle Park, NC.

The development of dosimetry models that can provide a description of the uptake and distribution of inhaled compounds throughout the body and the availability of animal toxicological data are integral components for a full evaluation of potential risks associated with human exposure. Interspecies dosimetric comparisons must be approached using a model conceptualization that incorporates the major factors affecting the uptake of the gas, such as respiratory tract morphology, route of breathing, depth and rate of breathing, physicochemical properties of the gas, etc. Modeling efforts thus far have primarily focused on ozone. A comparison of theoretical predictions of delivered dose of ozone to the lower respiratory tract of man shows good agreement with dose estimates derived from experimental measurements. Applications to ozone toxicological data in animals and man have been examined that incorporate the use of dosimetry models in studying quantitative dose-response relationships. (NTIS)

METHODS OF ESTIMATING AND MEASURING RISK

Lognormal model for health risk assessment of fluctuating concentrations.
Saltzman BE
Am Ind Hyg Assoc J; VOL 48, ISS 2, 1987, P140-9
Health risk assessments of exposures to harmful materials increasingly are required because of legal and economic pressures. An important part of the procedure is the mathematical model for the dose-effects relationship. If a linear no-threshold relationship is assumed, then the mean of fluctuating concentrations may be used for the calculation of health risk. But the widely used PEL and TLV values assume a threshold relationship. For this and for nonlinear relationships the calculation with the use of the mean concentration is inaccurate, because higher concentrations produce disproportionately higher effects. An appropriate mathematical model based upon lognormal concentrations and probit effects is proposed. Rather than monitoring concentrations for unlikely high values, the method requires estimation of their geometric mean and geometric standard deviation. A health risk assessment than may be calculated simply and conveniently from the charts and tables provided. The method clarifies some issues and the specifics of utilizing and improving the required data. The model should be useful for assessing health risks from fluctuating concentrations of most toxic compounds. (NLM)

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HEALTH RISKS

CANCER .... includes carcinogenesis, carcinogens, carcinogenicity, genetics, epidemiology, and multi-media exposure.

The need for biological risk assessment in reaching decisions about carcinogens.
International Commission for Protection against Environmental Mutagens and Carcinogens. ICPEMC publication No. 13.
Clayson DB
Mutat Res; VOL 185, ISS 3, 1987, P243-69
The prudent assumption that carcinogen bioassays in rodents predict for human carcinogenicity is examined. It is suggested that in certain cases, as for example the induction of tumors against a high incidence in controls, or in situations in which high dose toxicity may be a critical factor in the induction of

cancer, the probability that animal bioassays predict for humans may be low. The term 'biological risk assessment' is introduced to describe that part of risk assessment concerned with the relevance of specific animal results to the induction of human cancer. Biological risk assessment, which is almost entirely dependent on an understanding of carcinogenesis mechanisms, is an important addition to present mathematical modeling used to predict the effects of animal carcinogens that have been demonstrated after high dose exposure, to the effects of the much smaller doses to which humans are perceived to be exposed. Evidence for the conclusions reached by biological risk assessment may sometimes be supported by a careful review of human epidemiological data. (NLM)

HEALTH RISKS

GENOTOXICITY AND REPRODUCTIVE EFFECTS .... includes development and reproductive effects, embryo and fetal effects, fertility, exposure during pregnancy, teratogenicity, mutagenesis and mutagenicity, genetics and carcinogenesis, and neoplasia.

Issues in Risk Assessment in Male Reproductive Toxicology
(Journal article)
Zenick, H. ; Clegg, E. D.
Environmental Protection Agency, Washington, DC. Reproductive Effects Assessment Group.
Corp. Source Codes: 031287602
Report No.: EPA/600/J-86/291
PB87-175303/XAB
1986 13p
Jnl. of the American College of Toxicology, v5 n4 p249-259 1986.

Efforts in the area of risk assessment have concentrated primarily on cancer as an outcome. However, attention is now being directed toward the development of strategies for assessing risk to other target systems. The Reproductive Effects Assessment Group in the Office of Health and Environmental Assessment, U.S. EPA, is involved extensively in that effort in the areas of developmental and reproductive toxicology and mutagenicity. This group is currently preparing risk assessment guidelines for the male and female reproductive systems. Some of the issues associated with hazard identification and dose-response assessment with respect to male reproductive toxicity are discussed. (NLM)

CHEMICAL SPECIFIC RISK ASSESSMENT

ASBESTOS

An asbestos hazard in the reprocessed textile industry.
Quinn MM ; Kriebel D ; Buiatti E ; Paci E ; Sini S ; Vannucchi G ; Zappa M
Am J Ind Med; VOL 11, ISS 3, 1987, P255-66
Epidemiologic studies have identified an excess risk of lung cancer and mesothelioma among workers in the reprocessed textile industry in Prato, Italy. These studies suggested that there may have been asbestos hazard in this industry although exposure was not known to exist. An industrial hygiene investigation was conducted to determine whether there was previous or current asbestos exposure in the industry. Walk-through surveys, environmental sampling, process documentation, and management and worker interviews were conducted in 13 textile reprocessing establishments. Polypropylene bags that once contained asbestos were found in 2 of the 13. Asbestos bags were cut open and used to cover bales of rags which were then distributed throughout the world. Workers were exposed to asbestos while handling the bags which were contaminated with chrysotile, amosite, and crocidolite. Additional sources of asbestos exposure that may have existed in the past in the industry are also discussed. (NTIS)

DIOXIN

A critical evaluation of the use of mutagenesis, carcinogenesis, and tumor promotion data in a cancer risk assessment of 2,3,7,8-tetrachlorodibenzo-p-dioxin.
Shu HP ; Paustenbach DJ ; Murray FJ
Regul Toxicol Pharmacol; VOL 7, ISS 1, 1987, P57-88
Regulatory agencies in the Western Hemisphere are currently assessing the potential human health risks of environmental contamination by 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD). Some U.S. agencies such as the Environmental Protection Agency (EPA) and Centers for Disease Control (CDC) have assumed that TCDD behaves as a tumor initiator in animals and have used linear low-dose mathematical extrapolation models for estimating any human risk. In contrast, the Ontario Ministry of the Environment, the State Institute of National Health of The Netherlands, and Federal Environmental Agency of the Federal Republic of Germany have concluded that TCDD does not have initiator activity; these agencies have advocated a risk extrapolation approach which applies a safety factor to a no-observable-effect

level. Estimations of the potential risk obtained by these two approaches can differ by three to four orders of magnitude and have a major impact on the allocation of resources within the affected countries. This paper critically reviews the TCDD bacterial, animal, and human data on mutagenesis, carcinogenesis, and tumor promotion and concludes that the scientific evidence does not support risk estimations which are based on TCDD as a tumor initiator. Rather, the animal data overwhelmingly support TCDD as a tumor promoter. Risk estimations which incorporate tumor promotion activity more accurately reflect the scientific understanding of TCDD's mechanism of action and provide better estimates of its risk. (NLM)

Quantitative cancer risk assessments for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).
Sielken RL Jr
Food Chem Toxicol; VOL 25, ISS 3, 1987, P257-67
State-of-the-art quantitative risk assessment techniques, including consideration of new time-to-response data, have been applied to chronic animal bioassay data on the dietary intake of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). The non-linear shapes of the dose-response relationships for the hepatocellular carcinogenic responses have been estimated, and a review of the quantitative impacts of several of the choices involved in the quantitative risk assessment considers, particularly, the definition of the carcinogenic responses of concern, the experimental data set, the pathology evaluation, a biologically effective dose scale versus the administered dose, methods of making the fitted model responsive to the data at the lower experimental doses, consistency in dose-response shapes for different data sets, fitted model values versus bounds, the utilization of time-to-response information incorporating the lateness of the carcinogenic responses, and the method of characterizing the maximum acceptable dose. The estimated virtually safe dose for an increase of 0.000001 (one in a million) in the probability of hepatocellular neoplastic nodule and/or carcinoma in a female rat is approximately 0.1 ng/kg body weight/day in the diet. The estimated mean free dose, corresponding to a reduction in the expected amount of time without hepatocellular neoplastic nodule and/or carcinoma proportional to 1 wk in 70 yr, is in the range of 1-5 ng/kg body weight/day in the diet of a female rat. No species-to-species extrapolations nor human exposure assessments have been made. However, these estimated risks correspond to dietary intakes that are at least 150 times greater than the 0.0006365 ng/kg body weight/day intake described by the Centers for Disease Control as a reasonable level to begin consideration of action to limit human exposure. (NLM)

NITROGEN DIOXIDE

REVIEW OF THE U.S. CONSUMER PRODUCT SAFETY COMMISSION'S HEALTH EFFECTS AND EXPOSURE ASSESSMENT DOCUMENTS ON NITROGEN DIOXIDE,

EPA REPORT SAB-CASAC-86-021, MAY 86 (36)

FED GOVT REPORT THE NITROGEN DIOXIDE HEALTH EFFECTS AND EXPOSURE ASSESSMENT DOCUMENTS OF THE U.S. CONSUMER PRODUCT SAFETY COMMISSION WERE REVIEWED BY EPA'S CLEAN AIR SCIENTIFIC ADVISORY COMMITTEE. PRELIMINARY EVIDENCE FROM EPIDEMIOLOGIC AND RELATED INDOOR AIR POLLUTION MONITORING STUDIES SUGGEST THAT REPEATED PEAK EXPOSURES OF 0.3 PPM OF NO2 MAY CAUSE HEALTH EFFECTS IN SOME INDIVIDUALS AND RAISES THE POSSIBILITY THAT SUCH EFFECTS MAY OCCUR AT LEVELS AS LOW AS 0.1 PPM. GROUPS THAT APPEAR TO BE MOST SENSITIVE TO EXPOSURES INCLUDE CHLIDREN, ASTHMATICS, AND CHRONIC BRONCHITICS. HUMAN EPIDEMIOLOGIC STUDIES SUGGEST THAT EXPOSURE TO NO2 MAY LEAD TO INCREASED RESPIRATORY ILLNESS RATES AMONG CHILDREN. HOWEVER, THE MOST DIRECT EVIDENCE REGARDING LUNG DAMAGE ASSOCIATED WITH NO2 IS OBTAINED FROM ANIMAL STUDIES. (ENVL)

URANIUM

Quantitative risk assessment of lung cancer in U.S. uranium miners.

Hornung RW ; Meinhardt TJ

Health Phys; VOL 52, ISS 4, 1987, P417-30

The National Institute for Occupational Safety and Health (NIOSH) has recently updated the vital status of the U.S. cohort of U miners through the end of 1982. This represents 69 additional lung cancer deaths since the last published follow-up through 1977. This more recent data was used to generate quantitative risk estimates of lung cancer after exposure to Rn daughters. Relative risks were estimated through use of the Cox proportional hazards model with an internal referent group. Results indicated that the exposure-response relationship was a slightly convex curve, predicting excess relative risks between 0.9 and 1.4 per 100 working level months (WLM) in the lower cumulative exposure range. Other findings of interest include a significant exposure-rate effect with low exposure rates more harmful per unit of cumulative exposure (WLM). Two temporal effects which modify relative risk estimates were also found. Relative risk increased with age at initial exposure to underground U mining. However, relative risk of lung cancer fell dramatically in the years following cessation of exposure. (NLM)

VINYL CHLORIDE

A scientific basis for the risk assessment of vinyl chloride.
Developed jointly by the members of the Committee on the Evaluation of Carcinogenic Substances, National Health Council of The Netherlands.
Regul Toxicol Pharmacol; VOL 7, ISS 1, 1987, P120-7
In July 1984 the Minister of Welfare, Public Health and Culture, representing the Dutch government, sent a request to the Health Council of The Netherlands to advise on the health risks presented by environmental exposure to several carcinogenic substances. One of these substances was vinyl chloride (VC). On the basis of a working document prepared by the National Institute of Public Health and Environmental Hygiene, a committee of the Health Council of The Netherlands prepared a report concerning a health risk assessment of VC which was published in May 1986. A short review is presented of the available data and the considerations that formed the basis for the risk assessment of the carcinogenicity of VC to humans. The advice was based mainly on human data from epidemiological studies of workers occupationally exposed to VC. The committee concludes that continuous exposure to 0.001 mg/m3 VC corresponds to an additional cancer mortality risk of 10(-6) per lifetime. The Dutch government considers this additional risk to the general population to be acceptable. (NLM)

GENERAL

Environmental Protection Agency. Office of Research and Development. Office of Health and Environmental Assessment.
Health Assessment Documents:

1. Asbestos Health Assessment Update.
   PB86-242864
   EPA 600/8-84-003F

2. Carcinogen Assessment of Coke Oven Emissions.
   PB84-170182
   EPA 600/6-82-003F

3. Updated Mutagenicity and Carcinogenicity Assessment of Cadmium.
   PB85-243533
   EPA 600/8-83-025F

4. Acetaldehyde.
   First External Review Draft
   EPA 600/8-86/015A

5. Acrolein.
   First External Review Draft
   PB87-139960
   EPA 600/8-86/014A

6. Acrylonitrile.
   PB84-149152
   EPA 600/8-82-007F

7. Beryllium.
   Second External Review Draft
   PB86-183944
   EPA 600/8-84-026B

8. Mutagenicity and Carcinogenicity Assessment of 1,3-Butadiene.
   PB86-125507
   EPA 600/8-85-004F

9. Cadmium.
   PB82-115163
   EPA 600/8-81-023

10. Carbon Tetrachloride.
    PB85-124196
    EPA 600/8-82-001F

11. Chlorinated Benzenes.
    PB85-150332
    EPA 600/8-84-015F

12. Chloroform (2 Parts).
    PB86-105004
    EPA 600/84-004F

13. Chromium.
    PB85-115905
    EPA 600/8-83-014F

14. Dichloromethane (Methyl Chloride).
    PB85-191559
    EPA 600/8-82-004F
    Addendum: EPA 600/8-82-004FA
    Addendum: PB86-123742
              EPA 600/8-82-004FF

15. Epichlorohydrin.
    PB85-132363
    EPA 600/8-83-032F

16. Ethylene Dichloride (2 Parts).
    PB86-122702
    EPA 600/8-84-006F

17. Ethylene Oxide.
    PB86-102597
    EPA 600/8-84-009F

18. Hexachlorocyclopentadiene.
    PB85-124915
    EPA 600/8-84-001F

19. Hydrogen Sulfide.
    PB87-117420
    EPA 600/8-86-026A

20. Inorganic Arsenic.
    PB84-190891
    EPA 600/8-83-021F

21. Manganese (Parts 1 and 2).
    PB84-229954
    EPA 600/8-83-013F

22. Nickel.
    PB86-232212
    EPA 600/8-83-012FF

23. Polychlorinated Dibenzo-P-Dioxins.
    PB86-122546
    EPA 600/8-84-014F

24. Polychlorinated Dibenzo-Furans.
    First External Review Draft
    PB86-221256
    EPA 600/8-86/018A

25. Polycyclic Organic Matter (POM).
    Preprint
    PB82-186792
    EPA 600/8-79-008

26. Phosgene.
    PB87-147039
    EPA 600/8-86/022A

27. Tetrachloroethylene.
    PB85-249704
    EPA 600/8-82-005F
    Addendum: PB86-174489
              EPA 600/8-82-005FA

28. Toluene.
    PB84-100056
    EPA 600/8-82-008F

29. Trichloroethylene
PB85-249696
EPA 600/8-82-006F

30. 1,1,2-Trichloro-1,2,2-triflouroethane
PB84-118843
EPA 600/8-82-002F

31. 1,1,1-Trichloroethane Methyl Choroform.
PB84-183565
EPA 600/8-82-003F

32. Vinylidene Chloride.
PB86-100641
EPA 600/8-83-031F

33. Revised Evaluation of Health Effects Associated with Carbon Monoxide.
PB85-103471
EPA 600/8-83-026F

34. Biological Effects of Radiofrequency Radiation.
PB85-120848
EPA 600/8-83-026F

35. **Health Issue Assessments** are initial reviews of the scientific literature concerning the health effects associated with a given chemical or class of chemical substances.

Mercury Health Effects Update.
PB85-123925
EPA 600/8-84-019F

Summary Review of the Health Effects Associated with Chloroprene.
PB86-197662
EPA 600/8-85-011F

Summary Review of the Health Effects Associated with Copper.
PB87-137733
EPA 600/8-87/001

Summary Review of the Health Effects Associated with Phenol.
PB86-178076
EPA 600/8-86-003F

Summary Review of the Health Effects Associated with Propylene Oxide.
EPA 600/8-86/007F

Topical Report on the Meeting of the Gas Research Institute Indoor Air Quality Research Advisory Committee. Final Report February 11-13, 1986
Coerr, S. ; Johnson, D. O.
Gas Research Inst., Chicago, IL.
Report No.: GRI-87/0015
PB87-185187/XAB
Feb 86 85p
The document presents the conclusions and recommendations of the February 1986 meeting of the Gas Research Institute's (GRI's) Indoor Air Quality Research Advisory Committee, which was formed to provide advice on research results to date as well as on the emphasis and direction of the GRI Indoor Air Quality Research Program. Conclusions and recommendations are presented on possible health effects issues, exposure studies, risk assessment, and mitigation. Attachments provide an overview of the GRI program and summarize contractor presentations. (NTIS)

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HAZARDOUS WASTE

Estimating Population at Risk from Release of Hazardous Materials
Hillsman, E. L.
Oak Ridge National Lab., TN.
Corp. Source Codes: 021310000; 4832000
Sponsor: Department of Energy, Washington, DC.
Report No.: CONF-8610237-1
DE87002813/XAB
1986 21p
Joint seminar University of Wisconsin/Wisconsin State Department of Natural Resources, Madison, WI, USA, 24 Oct 1986.
Portions of this document are illegible in microfiche products.
Contract No.: AC05-84OR21400
A preliminary health and environmental assessment of the effects of alternative strategies for destroying a portion of the nation's chemical weapons stockpile (M55 rockets) is provided. This assessment considered options for continuing to store these munitions, for using a specially designed incineration process to destroy them at the five continental US locations and on the Johnston Atoll in the Pacific where they are currently stored, and for transporting some of the munitions from their storage sites to other storage sites for destruction. Although the assessment considered potential impacts on terrestrial and aquatic ecosystems as well as on human systems, the risk to human health from transportation operations was to be the primary consideration for choosing among the various alternatives and, if any munitions were to be moved, among alternative transportation modes to use for each origin-

destination pair. Several measures of risk to human health were to be computed, but all required information on the number of persons at risk from the various alternatives. 12 refs., 7 figs. (ERA citation 12:019079) (NTIS)

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RADIATION

Waste-Acceptance Criteria for Greater-Confinement Disposal
Gilbert, T. L. ; Meshkov, N. K.
Argonne National Lab., IL.
Sponsor: Department of Energy, Washington, DC.
Report No.: CONF-860990-14
DE87004672/XAB
1986 16p
Annual participants' information meeting of the DOE Low-Level Waste Management Program, Denver, CO, USA, 22 Sep 1986.
Contract No.: W-31109-ENG-38

A methodology for establishing waste-acceptance criteria based on quantitative performance factors that characterize the confinement capabilities of a waste-disposal site and facility has been developed. The methodology starts from the basic objective of protecting public health and safety by providing assurance that dispsoal of the waste will not result in a radiation dose to any member of the general public, in either the short or long term, in excess of an established basic dose limit. The method is based on an explicit, straightforward, and quantitative relationship among individual risk, confinement capabilities, and waste characteristics. A key aspect of the methodology is the introduction of a confinement factor that characterizes the overall confinement capability of a particular facility and can be used for quantitative assessments of the performance of different disposal sites and facilities, as well as for establishing site-specific waste-acceptance criteria. Confinement factors are derived by means of site-specific pathway analyses. They make possible a direct and simple conversion of a basic dose limit into waste-acceptance criteria, specified as concentration limits on radionuclides in the waste streams and expressed in quantitative form as a function of parameters that characterize the site, facility design, waste containers, and waste form. Waste-acceptance criteria can be represented visually as activity/time plots for various waste streams. These plots show the concentrations of radionuclides in a waste stream as a function of time and permit a visual, quantitative assessment of long-term performance, relative risks from different radionuclides in the waste stream, and contributions from ingrowth. 13 refs. (ERA citation 12:017870) (NTIS)

ECOLOGICAL RISKS

Toxicokinetic Modeling of (14)C-Pentachlorophenol in the Rainbow Trout ('Salmo gairdneri)

(Journal article)

McKim, J. M. ; Schmieder, P. K. ; Erickson, R. J.

Environmental Research Lab.-Duluth, MN.

Report No.: EPA/600/J-86/295

PB87-176434/XAB

1986 24p

Aquatic Toxicology, v9 p59-80 1986.

An in vivo trout model was used to monito the major routes and rates of pentachlorophenol uptake and elimination. A first-order kinetic model and observed data were used to generate fitted and predicted rate constants required for evaluation of first-order kinetic. The fitted first-order uptake-depuration curves for all experimental animals agreed with those observed suggesting first-order kinetics approximated the behavior of whole-body (14)C-pentachlorophenol (PCP) burden. (NTIS)

RISK MANAGEMENT

.... DESCRIBES REGULATORY DECISION-MAKING PROCESSES TO CONTROL AND MANAGE RISK

HAZARDOUS WASTE

Anaerobic Treatment of Industrial Wastes
Ng, A. S. ; Rose, C. M. ; Torpy, M. F.
Argonne National Lab., IL.
Corp. Source Codes: 001960000; 0448000
Sponsor: Department of Energy, Washington, DC.
Report No.: CONF-860965-1
DE87004673/XAB
1986 5p
National conference on anaerobic digestion of industrial wastes, Chicago, IL, USA, 10 Sep 1986.
Paper copy only, copy does not permit microfiche production.
Contract No.: W-31109-ENG-38
Interest in anaerobic biotechnology for the treatment of industrial wastes has grown considerably. Anaerobic biological waste treatment offers advantages over aerobic systems in terms of lower energy requirements, less biological sludge production, and the potential for energy recovery in the form of methane gas. The development of innovative reactor designs, based on the optimization of growth and retention of anaerobic microorganisms, has created an impetus to reevaluate the anaerobic treatability of many industrial waste streams. Data are presented to illustrate the potential applicability of anaerobic digestion for the treatment of a wide array of industrial process-waste streams, particularly those process-wastes originating from the Organic Chemical Production Industry. (ERA citation 12:018454) (NTIS)

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ECONOMIC ANALYSIS .... includes cost/benefit, cost/effectiveness.

Introduction to Cost-Effectiveness Analysis of Risk Reduction Measures in Energy Systems
International Atomic Energy Agency, Vienna (Austria).

Corp. Source Codes: 014014000; 3294000
Report No.: IAEA-TECDOC-383
DE87701286/XAB
Jul 86 70p
U.S. Sales Only.
The aim of this report is to introduce readers to methods of cost-effectiveness analysis and their application in risk reduction, especially in connection with the energy-producing industries. The background to the assessment of risk and the problems in estimating it quantitatively are outlined. The methodology of cost-effectiveness analysis is then described, particular attention being given to the way in which results are derived and the overall use that can be made of them. This is followed by a discussion of quantitative applications and an outline of the methods that may be used to derive estimates both of risk and the cost of reducing it. The use of cost-effectiveness analysis is illustrated in an appendix, which gives as a worked example a case study on the reduction of public risk associated with radioactive releases during normal operation of a PWR. After drawing some general conclusions the report recommends that such analyses should normally be used as an aid to risk management whenever several alternative risk reduction measures are under consideration. 36 refs, 28 figs, 14 tabs. (Atomindex citation 18:002962) (NTIS)

Reward systems and risk analysis
Garibaldi, C.A.
Amoco, Argentina Oil Co.
SPE Hydrocarbon Economics and Evaluation Symposium 8710065
Dallas, TX (USA) 2-3 Mar 1987
Society of Petroleum Engineers (SPE)
Society of Petroleum Engineers, Bookorder Department, P.O. Box 833836, Richardson, TX 75083-3836 (USA), Price: Domestic $24.00 (includes postage); foreign $24.00 (plus postage) Paper No. SPE-16314 (CPI)

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CORPORATE RISK MANAGEMENT

Risk Analysis: Why Don't Insurers Use Risk Analysis?
Baram, Michael
National Underwriter (Property/Casualty/Employee Benefits) v91n24 PP: 15-17 Jun 15, 1987

If insurers could better predict industrial risks to health, property, and the environment and then forecast potential liability and other losses, coverage could be better priced and more carefully placed. Contract terms and insurance products

could be written more carefully. Consequently, losses would be reduced, and despite variable interest rates, the insurance market could be restored. Probabilistic risk analysis (PRA) is available for insurers to predict risks. PRA is a process that involves: 1. an assessment of a particular activity for its hazardous features and failure ''pathways,'' 2. estimation of the likelihood and magnitude of such failures, 3. determination of the persons, property interests, or natural resources that would be exposed to estimated failures, 4. evaluation of the harmful implications of this exposure, and 5. use of statistical analysis and judgment to estimate probability of occurrence and the confidence level of the estimates. (ABI)

Risk COMMUNICATION

.... THE PROCESS OF EDUCATING AND INFORMING AN AUDIENCE TO MAKE BETTER PERSONAL AND SOCIETAL DECISIONS REGARDING RISK.

INFORMING THE DECISION-MAKER

Environment/Energy: Looking for Co-Communication
Harrison, E. Bruce
Public Relations Jrnl v43n6 PP: 5-6 Jun 1987

Companies across the US have started forming noncommercial partnerships with outside groups. These partnerships, called community right-to-know programs, are the law, set up by 1986 amendments to Superfund. Firms that handle chemicals classified as hazardous by the Occupational Safety and Health Administration are required to give technical information on those chemicals to a special local emergency planning committee in the community, the local fire department, and an emergency response commission in the state. Companies that deal with chemicals on the Environmental Protection Agency list of 402 extremely hazardous chemicals must tell the state emergency response commission if amounts of those chemicals in excess of a threshold planning quantity are to be handled. In addition, these companies must identify an emergency coordinator in the facility who will work with the local emergency planning committee. Essentially, community right-to-know requires a firm to prepare a crisis-communication plan and to be ready to carry it out on a recurring basis. (ABI)

Privacy rights: whose life is it anyway? employees concerned with preserving their privacy are wondering about the limits of a company's right to know.
Cook, Suzanne H.
Personnel Administrator 32:58-60+ Ap '87

Employees' legal rights to privacy in the public and private sectors; business safeguards for employees and for organizational liability. (PAIS)

"Right-to-know" rulings threaten regulatory framework.
Susser, Peter A.
Labor Law Journal 38 n5 297-303 May 1987 (LRI)

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INFORMING THE WORKER

Chemical hazard disclosure obligations: all manufacturing employers are now obligated to identify hazardous chemicals in their work places and to provide employees with information about them.
Susser, Peter A.
Employment Relations Today 13:301-8 Winter '86/'87
Requirements of the Hazard Communication Standard, first promulgated in 1983 by the U.S. Occupational Safety and Health Administration. (PAIS)

Hazard warnings ordered extended for all employees. (United Steelworkers of America, AFL-CIO-CLC v. Pendergrass)
Pennsylvania Law Journal-Reporter v10 p1 June 8 1987
col 3 017 col in.
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A program of poison center services to business and industry.
Krenzelok EP ; Dean BS
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Poison information centers have been developed to serve the poison information, treatment, and prevention education needs of the residents within their regions. These services are generally provided and funded by hospital-based centers. A limited number of centers receive local and state government financial support. In general poison information centers are nonrevenue-generating and rely upon these sources of fiscal support. As cost containment within the health care industry becomes more critical, poison centers are falling victims to budget cuts and even being eradicated in the interest of saving money. The private sector has provided grants to poison centers, but this represents a short term solution to a long term problem--the need for consistent funding. Business and industry have been overlooked as a source of potential revenue. Our poison center has developed an extensive program of services for the private sector. These include providing 24-hour-a-day poison information service on their behalf; developing a workers' right-to-know

program; identifying epidemiologic trends with their products, preparing exposure reports; etc. These services are provided for a specific fee which is determined by anticipated call volume, number of products to be included, medical and legal liability, etc. By providing services to the private sector, we have reduced the financial liability of our poison center by over 25%. (NLM)