

# RISK *newsletter*

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## Interdisciplinary Goal Pursued by SRA

Recent activities among SRA chapters and committees, as well as affiliated organizations, indicate that the Society for Risk Analysis is moving at a faster pace toward its stated goal of being an interdisciplinary society. When the Society for Risk Analysis was organized in 1980, the founders clearly had in mind that representatives from the health, physical and social sciences and from the fields of engineering, economics, law, etc. would meet under its umbrella to develop and share common approaches to difficult risk analysis problems. However, given the demands of the individual professions and the diversity of interests among the membership, developing a commonality of interests among the various disciplines has been a somewhat elusive goal. Now several events are occurring which seem to be pushing the Society in that direction.

### SRA Has Liaisons with 27 Societies

Under the leadership of Chairman James D. Wilson, Monsanto Company, the SRA Liaison Committee now has 25 persons acting as liaisons with 27 other professional societies. So that SRA members will know whom to contact about arranging joint activities with the other societies, the addresses and phone numbers of those serving as liaisons are given below.

**Air Pollution Control Association.** Thomas McKone, Lawrence Livermore Laboratory, Mail Stop L-453, Livermore, CA 94550 (Phone 415-422-7535).

**American Agricultural Economics Association.** Beverly Fleisher, U.S.D.A. Economic Research Service, Technology Research Assessment Section, Room 432B,

1301 New York Avenue, N.W., Washington, D.C. 20005-4788 (Phone 202-786-1456).

**American Anthropological Association.** Steve Rayner, Oak Ridge National Laboratory, Energy Division, P.O. Box X, Oak Ridge, TN 37831 (Phone 615-574-5348).

**American Association of Engineering Societies.** Alan Moghissi, P.O. Box 7166, Alexandria, VA 22307 (Phones 703-765-3546, 202-382-3139).

**American Bar Association.** Daniel Bronstein, Michigan State University, Department of Research Development, East Lansing, MI 48824-1222 (Phone 517-353-5326).

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Perhaps the most obvious successes have been those of the Liaison Committee, which, as related in an accompanying article, has now established connections with 27 other professional societies through 25 volunteers. The members of the committee help organize events that are cosponsored by SRA. For example, Lee Abramson of the Nuclear Regulatory Commission will be chairing a session cosponsored by SRA at the next American Statistical Association, which is meeting in New Orleans August 22-25. Titled "Statistical Issues in Selecting the First Geologic High Level Radioactive Waste Repository," the session has been organized by Pamela G. Doctor of Battelle NW and will include presentations by Norman Eisenberg, U.S. Department of Energy; Jane Booker, Los Alamos National Laboratory; and Robert Cranwell, Sandia National Laboratories. *(Continued on page 2.)*

## SRA's Goal

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Another cosponsored event will be held in conjunction with the 1988 annual meeting in Washington, D.C. Daniel Byrd and James D. Wilson, working with the American College of Toxicology, are planning a premeeting workshop (see article on 1988 annual meeting).

## Chapter Events

The Southern California Chapter recently sponsored a risk management workshop that was deliberately designed to address common problems. Although the primary interests of most of the attendees were large engineered systems, they were not interested in the *same* systems, and the discussions dwelt on common issues. It is the feeling of the chapter president and workshop organizer, George Apostolakis of the University of California, that "a workshop like that can define the role and the objectives of the society in the sense that the society can serve as a forum where ideas can be aired among people of

different disciplines." (See related story on workshop).

While more or less focusing on a single issue (Proposition 65), the Northern California Chapter was very instrumental in organizing a symposium in which scientists from various disciplines considered the numerous implications of California's new law on safe drinking water. In the words of one of the organizers, "just the financial implications are monumental." (See article by Jeff Daniels.)

## Other Activities

This month (May 9-13), SRA is one of several societies cosponsoring a short course entitled "Hierarchical-Multiobjective Approach in Water Resources Planning and Management. 1988 Theme: Risk Assessment and Management" that is being presented by the Center for Risk Management of Engineering Systems and the Systems Engineering Department of the University of Virginia. (See article on the center in this newsletter).

As is apparent from other articles in this newsletter, a number

of other SRA-sponsored activities are being fielded in the U.S. during the next several months, ranging from a course on risk management of engineering systems to an international symposium on risk assessments and management techniques for chemical mixtures.

In addition, SRA-Europe is proceeding with plans to hold its first conference in November. In keeping with SRA's interdisciplinary goal, the conference's purpose is to "bring together people from business, government and academia to discuss the utility of risk analysis in decision-making as a topic that is of general interest."

With the growing awareness of the many types of risks permeating society, it is obvious that SRA's founders acted with considerable foresight. To have anything but an interdisciplinary approach to these problems would be unthinkable. The members of the Society realize that, but they also know that much work lies ahead if SRA is to truly become *the* risk analysis society to which all disciplines look for guidance. (LSA)

## Liaison Committee

(Continued from page 1.)

**American Chemical Society.** Melvin Turetsky, IBM Corporation, 2000 Purchase Street, Purchase, NY 10577 (Phone 914-697-7114).

**American College of Toxicology.** Daniel Byrd, HSIA, 1225 19th Street, N.W., Suite 300, Washington, D.C. 20036 (Phone 202-223-5890).

**American Economic Association.** Howard Kunreuther, Department of Decision Science, Wharton School, University of Pennsylvania, Philadelphia, PA 19104 (Phone 215-898-4589).

**American Government Toxicologists.** Arthur Gregory, Environmental Monitoring and Services, Inc., 1101 15th Street NW, Suite 500, Washington, D.C. 20005 (Phone 202-429-9188).

**American Industrial Health Council.** James D. Wilson, Monsanto Co, 800 North Lindbergh, St. Louis, MO 63167 (Phone 314-694-8879).

**American Industrial Hygiene Association.** Dennis J. Paustenbach, Syntex (U.S.A.), Inc., 3401 Hillview Avenue, P.O. Box 10850, Palo Alto, CA 94303 (Phone 415-852-1018).

**American Political Science Association.** Branden B. Johnson, Division of Science and Research, New Jersey Department of Environmental Protection, CN409, 401 East State Street, Trenton, NJ 08625 (Phones 609-633-2324, 215-563-4112).

**American Psychological Association.** Paul Slovic, Decision Research, 1201 Oak Street, Eugene, OR 97401 (Phone 503-485-2400).

**American Public Health Association.** Jan L. Handke, E. C. Jordan Company, Corporate Place 128, 107 Audubon Road, Bldg. II, Suite 301, Wakefield, MA 01880 (Phone 617-245-6606).

## Sessions Being Selected for 1988 Annual Meeting

The 1988 Annual Meeting of the Society for Risk Analysis, which will be held October 30–November 2 at the Mayflower Hotel in Washington, D.C., will be taking full advantage of the time and location of the meeting. With the national elections imminent, the topic for the plenary session will be the role that risk assessment would play in either a Democratic or a Republican administration.

### Session Topics

In addition to the plenary session, the Program Committee has received requests for sessions on a number of topics, including (1) successful public involvement in risk communication, (2) biotechnology risks, (3) risk analysis and global issues, (4) insurance perspectives on risk assessment, (4) risk assessment for diffused risks, and (5) short-term toxicological testing for setting priorities. A consistent comment on past meetings has been the difficulty of attending papers because of the large number of concurrent sessions. The goal of this year's conference is to have no more than three concurrent sessions at any time. In addition to the

traditional platform sessions, extensive poster sessions will also be held.

### Premeeting Workshop

On October 29 and 30, SRA will join with the American College of Toxicology in sponsoring a premeeting workshop on "Inferring Carcinogenic Effects in One Species with Data from a Second Species." This workshop, which is being organized by Daniel Byrd and James D. Wilson, will be held at the International Hotel near the Baltimore-Washington International Airport. For further information on the workshop, contact Alexandra Ventura (Phone 301-571-1840).

### Annual Meeting Hosts

The hosts for the 1988 Annual Meeting will be the members of the National Capital Area Chapter, whose current president is Jerry LR Chandler. SRA President-Elect Richard E. Schwing is Annual Meeting Chairman, and Constantine Zervos is General Meeting and Program Committee Chairman. (For more information, call Zervos at 202-245-1072.)

### Liaison Committee

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**American Society of Mechanical Engineers.** Alan Moghissi, P.O. Box 7166, Alexandria, VA 22307 (Phones 703-765-3546, 202-382-3139).

**American Sociological Association.** George Oliver Rogers, P.O. Box X, Mail Stop 206, Bldg. 4500N, Oak Ridge National Laboratory, Oak Ridge, TN 37831 (Phone 615-574-4016).

**American Statistical Association.** Lee Abramson, Nuclear Regulatory Commission, Office of Research, Washington, D.C. 20555 (Phone 202-443-7987).

**Association of American Geographers.** Allen White, Professor of Geography, University of Connecticut, 85 Lawler Road, West Hartford, CT 06117 (Phone 203-241-4832).

**Association of Groundwater Scientists and Engineers.** Nancy L. Cichowicz, Mitre Corporation, 7525 Colshire Drive, McLean, VA 221002-3481 (Phone 703-883-6552).

**Chemical Manufacturers Association.** James D. Wilson, Monsanto Company, 800 North Lindbergh, St. Louis, MO 63167 (Phone 314-694-8879).

**Health Physics Society.** William Mills, Oak Ridge Associated Universities, 1019 19th Street, Suite 700, Washington, D.C. 20036 (Phone 202-653-5505).

**IEEE.** Kazuhiko Kawamura, Associate Professor, Management of Technology Program, P.O. Box 6188, Station B, Vanderbilt University, Nashville, TN 37235 (Phone 615-322-2735).

**Institute of Industrial Engineers.** Vance Wilkinson, Oak Ridge National Laboratory, Bldg. 9108,

Mail Stop 1, Oak Ridge, TN 37831 (Phone 615-574-9548).

**Institute of Management Science.** Raymond F. Boykin, California State University–Chico, Department of Accounting, Chico, CA 95929-0011 (Phone 916-895-5193).

**Society for Epideminological Research.** Linda Erdreich, ICF/Clement Associates, Inc., Metro Park, 399 Thornall Street, Edison, NJ 08837 (Phone 201-906-2400).

**Society of Toxicology.** David P. McFadden, Mead World Headquarters, Courthouse Plaza N.E., Dayton, OH 45463 (Phone 513-439-9260).

**Systems Safety Society.** Thomas J. Janicik, Science Application International Corporation, 5150 El Camino Real, Suite C-31, Los Altos, CA 94022 (Phone 415-960-5975).

# Symposium Examines Risks from Toxics in Northern California Environment

*(Editor's Note: On April 8-9, the Northern California Chapter of the Society for Risk Analysis [NCCSRA] joined with the California Academy of Sciences [CAS] and the U.S. Environmental Protection Agency [EPA] to cosponsor a symposium on "Assessing the Risks from Toxics in the Northern California Environment: What Science Can Tell Us" at the California Academy of Sciences in Golden Gate Park, San Francisco. A principal organizer of the symposium was SRA Executive Committee Member D. Warner North of Decision Focus, Inc. He is immediate past president of NCCSRA and an appointee to the California Governor's Scientific Advisory Panel for the implementation of California's Safe Drinking Water and Toxic Enforcement Act of 1986 [popularly referred to as Proposition 65]. The following report is a Risk newsletter summary of a rather detailed article on the highlights of the symposium published in the April 21 issue of NCCSRA Newsletter. The full article may be obtained by calling the author at 415-422-0910.)*

by **Jeffrey I. Daniels**  
Secretary, NCCSRA

Opening remarks on the morning of April 8, 1988, by Frank Talbot, director of the California Academy of Science, and by Daniel McGovern, regional administrator for U.S. EPA Region IX, left no doubt about the intended focus of the two-day symposium on "Assessing Risks from Toxics in the Northern California Environment: What Science Can Tell Us." It was to learn how good science and risk assessment can lead to meaningful risk management, and anyone wanting to "stop technology" would not be finding a forum.

The symposium began with Thomas Warriner, undersecretary of the State of California Health and Welfare Agency, stating that the instructions of the governor of California for implementing Proposition 65 were (1) to pay attention to good science and use it objectively, (2) to avoid pressures from special-interest groups, (3) to adopt rules that will limit uncertainty and improve predictability, and (4) to apply common sense to the rule-making process (i.e., the formal regulations should be simple, understandable, and logical).

A 12-member Governor's Scientific Advisory Panel, of which SRA member D. Warner North is a member, has helped develop a list of 200 chemicals for which health risks are to be identified.

Important aspects of the legislation include the applicable regulations for dischargers in California, which are scheduled for implementation on October 27, 1988. Basically, a no-significant risk level for toxic substances in drinking water is to be observed.

## Extent of Warnings

A controversial issue in implementing Proposition 65 is the extent to which the public should be warned of toxics. As an example, Warriner questioned whether toys or flashlights with enclosed batteries (which contain chemicals with significant risk) should be labeled. In addition to written labels, an innovative alternative of making 1-800 telephone numbers available to commerce is being considered.

## Risk Analysis Perspective

The next presentation was by Chris Whipple of the Electric Power Research Institute. Having been the president of SRA in 1982-83 and now serving as president-elect of NCCSRA, he gave a historical perspective on risk analysis and management. He pointed out that the prototype analysis for carcinogenic risk was developed for ionizing radiation, and that the methodology has traditionally involved extrapolations from high doses to assess the risk at low doses. However, recent trends in dose-response modeling aim for more biological realism and an examination of pharmacokinetic pathways in detail.

In risk management, social and perceptual factors play a key role. For example, before the term "probability of effect" was accepted, the term "no observable effect" based on safety factors was the approach and led to the banning of such substances as saccharin. In addition to accurate assessments, good risk communication is vital, since public estimates of risk are proportional to newspaper coverage and public opinions could have a greater influence than scientific evidence on risk management decisions.

### Case Studies Addressed

The remainder of the first day was devoted to presentations of case studies of specific toxics, from which the following notes were taken:

(1) **Lead** (*Bernard Weiss, University of Rochester*). Recent studies have shown a striking difference in infant development at 24 months between groups exposed to high, medium and low lead concentrations, supporting previous correlations between blood concentrations of lead and lowered scholastic performance in children.

(2) **Ozone** (*Morton Lippmann, New York University Institute of Environmental Medicine*). Adverse responses to ozone seem to be driven by cumulative exposure and not by concentration.

(3) **Selenium in Kesterson Reservoir** (*Noel Williams, CH2M-Hill Consultants*). Selenium concentrations in the reservoir, related to agricultural drainage water, are adversely affecting bird populations.

(4) **Tributyltin (TBT)** (*Robert Huggett, College of William and Mary*). TBT, used in marine paints to combat the larvae of barnacles and spores of algae on boat bottoms, has been shown to severely impact the oyster populations in coastal areas near Virginia and France. Virginia has banned TBT from use on small recreational boats. (*Edward Goldberg, Scripps Institution of Oceanography*, added that environmental interest groups were not as effective a lobby for banning TBT as they had been for DDT, no doubt because participation of active and knowledgeable scientists in the environmental movement has fallen off recently. However, Virginia took action because individual scientists who reviewed the data noted the severity of the problem and brought it to the state's attention.)

(5) **Chlorinated Solvents in Groundwater** (*John Wise, Deputy Regional Administration for EPA Region IX, and Keith Hinman, EPA's project manager for the Integrated Environmental Management Project [IEMP]*). IEMP is an assessment of health risks from the effects of chlorinated solvents in groundwater in the Santa Clara Valley. It is also a partnership with the community to test the application of risk assessment and risk management in a local environment.

(6) **Dioxin** (*William Farland, U.S. EPA*). Three different dose-response models applied to dioxin yield different estimates of the maximum level for no significant risk. EPA has concluded that a daily dioxin dose of 0.1 pg/kg represents a safe level and

is within the "comfort zone" of estimated safe doses predicted by all the models.

### Risk Assessment Guidelines

On the second day of the symposium, Warner North introduced a session titled "Risk Assessment of Impacts from Toxics" by identifying the steps for risk assessment as (1) hazard identification, (2) dose-response assessment, (3) exposure assessment, and (4) risk characterization. He also discussed the role of inference options, as, for example, in selecting the appropriate dose-response model, choosing an applicable factor for extrapolating from animal data to humans (based on surface area or body weight), and determining the strain of animal model to use (e.g., the most sensitive).

William Farland, U.S. EPA, commented on EPA's five risk assessment guidelines addressing (1) carcinogenicity, (2) mutagenicity, (3) developmental toxicology, (4) chemical mixtures, and (5) exposure assessments. He pointed out that risk managers make decisions not only on the basis of risk assessment information, but also on the basis of statutory and legal requirements, consideration of economic consequences, social considerations, and informed judgements.

Herschel Griffin, a member of the Governor's Scientific Advisory Panel for Proposition 65, discussed the most recent version of California's risk assessment guidelines (published in 1985). Contrasting the roles of molecular biology and epidemiology in cancer risk assessment, he noted that toxicologists argue that a catastrophe is an event of such magnitude that even an epidemiologist can identify the cause. The epidemiologists respond that epidemiology does not deal in trifles. However, he concluded that advancement in both fields will aid in improving cancer risk assessments.

### Ecological Impacts of Toxics

Harold Mooney, Stanford University, stated that the quality of data on ecological impacts is still too poor to exercise formalisms such as those that had been discussed for human systems. Data are being collected, however. For example, it has been observed that many plants are less susceptible to effects from air pollution in times of drought because they close their stomates to reduce water loss. He repeated the 1966 statement by George Woodwell that "There is no longer safety in the vastness of the earth" and therefore ecological impacts must be identified and mediated. (*Continued on page 6.*)

## Northern California Symposium

(Continued from page 5.)

### Summary by Milton Russell

Most of the remainder of the second day was devoted to two panel discussions, one on "How Should the Risk from Toxics Be Managed" and another on "Risk Management Under Proposition 65 in California," followed by an overall summary of the symposium by Milton Russell, former assistant administrator of EPA and now in a joint appointment at The University of Tennessee and Oak Ridge National Laboratory.

Russell began by noting that no villains or heroes had emerged during the symposium. Rather, responsible approaches for assessing and managing risk had prevailed. He emphasized the need to quantify risks so that distinctions can be made between those of matchbox size and those as big as a barn. He also reminded the audience that the public understands only two probabilities: one and zero. Consequently, risk communication has a long way to go.

In conclusion, Russell referred to the air pollution problem in Southern California. To reduce

pollution levels to the maximum permissible, the South Coast Air Quality Management District (SCAQMD) would have to reduce current pollution levels by 70%. Because automobiles seem to contribute the most to the high levels of ozone at low elevations in ambient air, the SCAQMD devised a plan that would tax second cars \$1000 annually, force 20% of commerce in the region to work four 10-hour days per week, restrict driving to odd or even days for most people, employ toll roads, and build massive rapid-transit systems. When the plan was evaluated, however, it was discovered that it would reduce the ozone level only a fraction of what was needed and would not be accepted by the public. On the other hand, if people were consistently to suffer visible effects from ozone exposure, if such effects were permanent and not transient, and if the solutions were practical and realistic, then drastic solutions might be tolerable to a vast majority of those potentially at risk.

As one attendee who found the symposium to be both instructive and interesting, I commend the organizers and their staffs for all their efforts and congratulate them on the success of the symposium.

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## SRA's Annual Carcinogen Course Well Attended

Approximately 45 persons attended SRA's third annual course on "Carcinogen Risk Assessment," which was held March 28-30 at the Capital Hilton in Washington, DC. The course is designed to provide an introductory overview to the methodologies, assumptions, and new research in the cancer risk assessment area. This year, for the first time, the attendees were presented with a text, *Carcinogen Risk Assessment*, which was edited by Curtis Travis and had just been published by Plenum Publishing Corporation in the SRA series entitled "Contemporary Issues in Risk Analysis."

Lecturers at the three-day course were Elizabeth Anderson, Roy Albert, Mark Bashor, Vincent Covello, William F. Farland, Bernie Goldstein, Suresh Moolgavkar, Don Mattison, Curtis Travis, Chris Whipple, and Mimi Yu.

Because of the favorable responses to the course, it will again be offered in the spring of 1989 at a location in Washington.

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## SRA Cosponsors Symposium on Chemical Mixtures

SRA will cosponsor a symposium entitled "International Symposium on Chemical Mixtures: Risk Assessment and Risk Management," to be held June 7-9 at the Omni Netherland Plaza Hotel in Cincinnati, Ohio (35 West 5th Street). The purpose of the symposium will be to review state-of-the-art techniques and approaches to quantifying the potential risks of exposure to chemical mixtures.

The symposium is being conducted as a memorial to Jerry S. Stara, a renowned scientist who at the time of his death last year was the director of EPA's Environmental Criteria and Assessment Office in Cincinnati. The office has the responsibility for providing water-related criteria documentation and health evaluations and provides support for EPA's hazard waste and superfund program.

For further information on the symposium, call Kate Schalk, Eastern Research Group, Inc., 617-648-7810.

**Rescheduled:****SRA Risk Courses for Large Engineered Systems**

Because of requests from several potential attendees, SRA's four short courses on the risk assessment and risk management of large engineered systems (originally scheduled for May 24-27 in Arlington, Virginia) have been rescheduled for August 9-12. As announced in the last newsletter, the courses, which will run concurrently, will be titled as follows:

- (1) Probabilistic Risk Assessment of Nuclear Power Plants (Including an Approach to Individual Plant Examinations).
- (2) Power Plant Availability Improvement.
- (3) Quantitative Risk Assessment and Risk Management of Space and Defense Systems.
- (4) Quantitative Risk Assessment and Risk Management in the Chemical and Petroleum Industries.

The quantitative risk models used will be those developed by Pickard, Lowe and Garrick, Inc., for a large variety of plants and technological systems in the space and defense, chemical and petroleum, and nuclear industries. Each course will have up to 10 instructors.

**Guest Speakers**

The program will also feature three guest speakers: **Alton D. Slay**, General, USAF (Ret.), past commander of the Air Force Systems Command at Andrews Air Force Base, Maryland, and chairman of the National Research Council's Space Criticality Review and Hazard Analysis Audit Committee; **Norman C. Rasmussen**, McAfee Professor of Engineering at Massachusetts Institute of Technology and director of the first landmark PRA study on reactor safety (WASH-1400); and **Peter W. Huber**, writer, lawyer (degree from Harvard) and mechanical engineer (PhD from MIT), who has his own law firm in Washington, DC.

The courses will be held at the Stouffer Concourse Hotel in Arlington, VA (Phone 703-979-6800). Reservations for the courses should be made with Roseann Wright, Pickard, Lowe, and Garrick, Inc., 2260 University Drive, Newport Beach, California, 92660 (Phone 714-650-8000).

**Calendar of Events**

—June 2-3. WORKSHOP ON EVALUATION AND EFFECTIVE RISK COMMUNICATION, Hyatt Regency Hotel, Washington, D.C. Sponsored by Task Force on Environmental Cancer and Heart and Lung Disease and other organizations. Contact: David McCallum, Institute for Health Policy Analysis, Georgetown University School of Medicine, 2121 Wisconsin Ave., NW, Suite 220, Washington, DC 20007.

—June 6-10. 1988 SYMPOSIUM FOR SOCIAL SCIENCE IN RESOURCE MANAGEMENT, University of Illinois, Urbana-Champaign. (See September 1987 newsletter.) Contact: Joanne Vining, Institute for Environmental Studies, University of Illinois, 408 South Goodwin Ave., Urbana, IL 61801 (Phone 217-333-6145).

—June 13-18. THIRD ANNUAL OCCUPATIONAL HEALTH AND SAFETY INSTITUTE, Wellesley College, Wellesley, Massachusetts. Contact: Occupational Health Program, Department of Family and Community Medicine, University of Massachusetts Medical Center, 55 Lake Avenue North, Worcester, MA 01655.

—June 19-22. 27th ANNUAL PROFESSIONAL DEVELOPMENT CONFERENCE AND EXPOSITION OF AMERICAN SOCIETY OF SAFETY ENGINEERS, Bally's Hotel, Las Vegas, Nevada. Covering chemical effects in the workplace; survival planning for the future; safety, health and environmental interface: physical and psychological stress; ergonomics—the next generation; high risk disease notification and prevention act; right-to-know/SARA Title III; OSHA in the year 2000; organized labor and management interrelationships. Contact: ASSE Conference Dept., 1800 East Oakton St., Des Plaines, IL 60018-2187 (Phone: 312-692-4121).

—June 27-30. SIXTH ANNUAL SUMMER INSTITUTE IN RISK MANAGEMENT IN ENVIRONMENTAL HEALTH AND PROTECTION, New York University, Graduate School of Public Administration. (See January newsletter.) Contact: Ramon G. Burke, Administrative Aide, Graduate School of Public Administration, New York University, 4 Washington Square North, New York, NY 10003 (Phone: 212-998-7430).

—August 22-26. SUMMER SESSION ON QUANTITATIVE RISK ASSESSMENT FOR ENVIRONMENTAL AND OCCUPATIONAL HEALTH HAZARDS. Massachusetts Institute of Technology, Cambridge, Massachusetts. Offered under the auspices of the Center for Technology, Policy and Industrial Development. To provide the basic background for technically oriented people to participate as members of interdisciplinary teams in the quantitative assessment of health risks. Contact: Office of the Summer Session, Room E19-356, MIT, Cambridge, MA 02139 (Phone: 617-253-2101).

—October 30—November 2. ANNUAL MEETING OF SOCIETY FOR RISK ANALYSIS, Mayflower Hotel, Washington, D.C. (See story in this newsletter.)

—November 10-11. FIRST CONFERENCE OF SRA-EUROPE, Laxenburg, Austria. (See Call for Papers in January newsletter.) Contact: P. J. Stallen, SRA Europe, c/o Emmastratt 16, 1075 HT Amsterdam/The Netherlands (Phone: 31 20 620696).

## SCSRA Chapter Holds Workshop on Decision Making

The Southern California Chapter's workshop on "Risk Management and Decision Making Under Uncertainty," held April 8 at the UCLA Faculty Center, was attended by over 60 persons, many of whom participated in four scheduled discussion periods. The attendees represented the aerospace, defense, nuclear power, and chemical and petroleum process industries. Feedback from the meeting has convinced the chapter that the format used—three or four 20-minute presentations followed by extended discussion periods—promoted lively debates among the attendees. The program for the meeting was as follows:

—*Welcoming Remarks*, G. E. Apostolakis, University of California, Los Angeles (SCSRA president and organizer of the meeting).

—*The Foundations of Decision Making*, M. F. Rubinstein, University of California, Los Angeles.

—*Public Values in Risk Evaluation*, D. von Winterfeldt, University of Southern California.

—*Quantitative Criteria for Risk Management*, W. E. Kastenberg, University of California, Los Angeles.

—*Experience in Licensing of Resource Recovery Facilities and the Impact of Risk Assessment*, S. A. Broiles, Esq., Richards, Watson, Gershon.

—*DISCUSSION*

—*The Role of Risk Assessment in Public Hearings*, V. Joksimovich, NUS Corporation.

—*The Challenge of Risk Assessment Communication at a Large PCB Spill Cleanup*, L. R. Froebe, IT Corporation.

—*DISCUSSION*

—*What Does a One-in-a-Million Risk Mean?*, S. A. Anderson, R. F. Weston, Inc.

—*The Approach to Risk Analysis in Three Industries: Nuclear Power, Space Systems, and Chemical Process*, Stan Kaplan, Pickard, Lowe, and Garrick, Inc.

—*Risk Management for a Major Aerospace Program*, B. Krishan, McDonnell-Douglas Astronautics Company.

—*DISCUSSION*

—*Risk Assessment for the Selection of a Chemical Munitions Disposal Alternative*, M. G. Stamatelatos, GA Technologies, Inc.

—*Use of Risk Analysis for Setting Research Priorities for a Future Oil Shale Industry*, L. B. Gratt, IWG Corporation.

—*DISCUSSION*

## East Tennessee Chapter Holds 5th Methods Day

SRA's East Tennessee Chapter held its fifth annual "Risk Analysis Methods Day" on April 20 at the American Museum of Science and Energy in Oak Ridge, Tennessee. Members of the Planning Committee were C. C. Travis (chapter president), S. V. Kaye (who also chaired the meeting), W. Colglazier, W. R. Rhyne, and Samantha Richter Pack. The program for the meeting was as follows:

—*An Overview of the Possible Correlation Between Aluminum Intake and Alzheimer's Disease*, James T. Fleming, University of Tennessee, Department of Biochemistry.

—*Genetic Engineering*, University of Tennessee, Center for Environmental Biotechnology.

—*Use of Transportable Storage Casks in the Nuclear Waste Management System*, Rick Emmett, H&R Technical Associates.

—*Seismic Risks in the Eastern United States*, Jim Beavers, Martin Marietta Energy Systems, Engineering.

—*The Use of Short-Term Assay Data to Predict Long-Term Health Effects*, Samantha Richter Pack, Oak Ridge National Laboratory, Health and Safety Research Division.

—*Structure Activity Relationships and Teratogenesis*, Terry Schultz, University of Tennessee, College of Veterinary Medicine.

—*Update on Aids Risk*, Daniel Ely, University of Tennessee, Department of Medicine.

—*Human Reliability Models*, Ed Daugherty, Science Applications International Corporation.

Cosponsors for the meeting were the Office of Risk Analysis, Oak Ridge National Laboratory, and H&R Technical Associates.

## Philadelphia Chapter Learns of "Hidden Danger"

A program entitled "Hidden Danger at Union Lake?" was presented as a lesson in risk communication at the April 15 meeting of the Philadelphia Chapter. Judy Shaw, acting manager of the New Jersey Department of Environmental Protection, and Robert Hazen, manager of the NJDEP Risk Assessment Unit, described their experiences of working with the public to resolve the problem of arsenic contamination in New Jersey's Union Lake. The meeting was held in Steinberg-Deitrich Hall on Penn Campus.



## Northern California Chapter Has May, June Events

On May 13, the Northern California Chapter will cosponsor a one-day "Annual Conference on Toxicology 1988," together with the NorCal Chapter of the Society of Toxicology and the local chapter of the Association of Government Toxicologists. The conference will be held at the Letterman Army Institute of Research located on the San Francisco Presidio. John Urquhart, M.D., who is president of Apex Corporation in Palo Alto and an NCCSRA executive council member, will give one of the plenary addresses ("On the Gap Between Experimental Animals and Man in Risk Assessment").

An NCCSRA dinner meeting will be held on June 29 at Shenanigan's Restaurant in Jack London Village, Oakland. The speaker will be Leonard Sagan, M.D., who manages the Radiation Studies Program at the Electric Power Research Institute. He is the author of the recently published book *The Health of Nations*, and formerly was director of environmental medicine at the Palo Alto Clinic. His topic will be "How Can You Know About Risk If You Don't Understand Health?" (For more information on this meeting, call Jeff Daniels [415-422-0910] or Chris Whipple [415-855-2443].)

## Four Countries Interested in Forming SRA Sections

Vlasta Molak, who was appointed by President Vincent Covella as a special international coordinator for the formation of SRA sections, reports that she has been in contact with interested parties in Yugoslavia, Argentina, the Philippines, and Israel. During May she will be traveling to Yugoslavia (her native home) and expects to meet there with potential section leaders with whom she has spoken. The possibilities in Argentina and Israel have also resulted from her direct personal contacts; in the case of the Philippines, she received a letter of inquiry following the notice of her appointment in the last newsletter.

**NOTE:** Vlasta Molak has the following new address: National Institute of Occupational Safety and Health (NIOSH), Mail Stop 31, 4676 Columbia Parkway, Cincinnati, Ohio 45226 (Phone 513-533-8334).

## Wallace to Address Lone Star Chapter

Lawrence Wallace of the EPA's Air, Toxics, and Radiation Staff, Office of Acid Deposition, Environmental Monitoring and Quality Assurance, will be the speaker at the next meeting of SRA's Lone Star Chapter, which will be held in Houston on June 20 at a place and time to be announced. His topic will be "New EPA Methodology for Direct Measurement of Total Exposure to Pollutants." He will also present summaries of some results obtained with the methodology (called the *Total Exposure Assessment Methodology* [TEAM]) and discuss the implications for risk assessment.

## National Capital Area Chapter Hears Fabrikant

The National Capital Area Chapter met April 14 at Environ Corporation to hear Jacob I. Fabrikant, a radiation scientist and radiologist at the Donner Laboratory of the University of California, Berkeley, speak on "Health Risks of Radon and Other Internally Deposited Alpha Emitters." The speaker has degrees in both medicine and physics and was chairman of the National Research Council committee that produced the BEIR IV report on the health risks of alpha-emitting radionuclides. He is also a member of NRC's current BEIR V committee and its Board on Radiation Effects Research.

## Brown Speaks to New England Chapter

The New England Chapter met at the MIT Faculty Club on April 13 to hear Halina Brown of Clark University, who is well known for her work on the use of toxicology and risk assessment by different regulatory agencies. Her topic was "Three Hundred Years of Trace Pollutants: What Have We Learned?"

### CORRECTION

The Research Triangle Chapter meets monthly at the *Chemical Industry Institute of Toxicology (CIIT)* in Research Triangle Park and not at the Chemical Industries Institute as was reported in the last newsletter.

## Journal Contents

The table of contents of Vol. 8, No. 2 of the SRA journal *Risk Analysis* is reprinted below.

### EDITORIALS

Adam M. Finkel, *Dioxin: Are We Safer Now Than Before?*

Terry F. Yosie, *The EPA Science Advisory Board: A Ten-Year Retrospective View*

Don Ritter, *The Need for Risk Assessment Legislation*

### DISTINGUISHED CONTRIBUTION TO RISK ANALYSIS

Gilbert F. White, *Paths to Risk Analysis*

### ARTICLE WITH COMMENTS

*Article:* Roger E. Kasperson, Ortwin Renn, Paul Slovic, Halina S. Brown, Jacque Emel, Robert Goble, Jeanne X. Kasperson, and Samuel Ratick, *The Social Amplification of Risk: A Conceptual Framework*

*Comment:* Roy A. Rappaport, *Toward Post-Modern Risk Analysis*

*Comment:* Arie Rip, *Should Social Amplification of Risk Be Counteracted?*

*Comment:* Ola Svenson, *Mental Models of Risk, Communication and Action: Reflections on Social Amplification of Risk*

*Comment:* Steve Rayner, *Muddling Through Metaphors to Maturity: A Commentary on Kasperson et al., "The Social Amplification of Risk"*

### OTHER ARTICLES

Irva Hertz-Picciotto, Norman Gravitz, and Raymond Neutra, *How Do Cancer Risks Predicted from Animal Bioassays Compare with the Epidemiologic Evidence? The Case of Ethylene Dibromide*

Leon B. Ellwein and Samuel M. Cohen, *A Cellular Dynamics Model of Experimental Bladder Cancer: Analysis of the Effect of Sodium Saccharin in the Rat*

James J. Chen, Ralph L. Kodell, and David W. Gaylor, *Using the Biological Two-State Model to Assess Risk from Short-Term Exposures*

Jeryl L. Mumpower, *Lottery Games and Risky Technologies: Communications About Low-Probability, High-Consequence Events*

Pieter Jan M. Stallen and Arend Tomas, *Public Concern About Industrial Hazards*

Vincent T. Covello, Kazuhiko Kawamura, Mark Boroush, Saburo Ikeda, Paul F. Lynes, and Michael S. Minor, *Cooperation vs. Confrontation: A Comparison of Approaches to Environmental Risk Management in Japan and the United States*

F. Reed Johnson, *Economic Costs of Misinforming About Risk: The EDB Scare and the Media*

Rex V. Brown and Jacob W. Ulvila, *Does a Reactor Need a Safety Backfit?: Case Study on Communicating Decision and Risk Analysis Information to Manager*

Jacques Lombard, René Coulon, and Alain Despres, *An ALARA Approach to the Radiological Control of Foodstuffs Following an Accidental Release*

Alan Q. Eschenroeder and Edward J. Faeder, *A Monte Carlo Analysis of Health Risks from PCB-Contaminated Mineral Oil Transformer Fires*

### SOFTWARE REVIEWS

Glenn W. Suter II, Lawrence W. Barnthouse, and A. E. Rosen, *RAMAS-7: Risk Analysis and Modeling for Age-Structured Populations*

### SOFTWARE LISTINGS

Paul D. Moskowitz

### BOOK REVIEWS

Robin K. White

Manuscripts of articles for the journal should be submitted to: Curtis Travis, Editor, *Risk Analysis*, Bldg. 4500S, S204, Oak Ridge National Laboratory, PO Box X, Oak Ridge, TN, 37831.

Reviews of risk analysis software and software submitted for review should be mailed to: Paul D. Moskowitz, Biomedical and Environmental Assessment Division, Brookhaven National Laboratory, Upton, NY, 119 73.

## Journal Notice!

Plenum Publishing Corporation has informed SRA that it will supply free replacement issues of the Society's journal, *Risk Analysis*, only for a period of six months from the original production date. After that, the office of the SRA Secretariat will supply free issues from available office stock. When the office stock is exhausted, back issues can be purchased by members from Plenum's Warehouse by writing to: J. S. Cannors, 49-65 Lansdowne Street, Boston, MA 02215. (Exception: All new members will be supplied the entire volume for the year in which they join the Society.)

# University of Virginia Has Risk Center

*(Editor's Note: RISK newsletter continues its series of articles on risk centers, featuring in this issue a new center at the University of Virginia.)*

A new Center for Risk Management of Engineering Systems at the University of Virginia is dedicated to developing solutions to risk problems in engineering, business, and government through a unique blend of disciplines and research interests at the university. Directed by Yacov Y. Haimes, Lawrence R. Quarles Professor of Engineering and Applied Science, the center will involve not only engineering departments but also faculty and researchers from throughout the university in order to address in a systematic, unified way the many facets of technology and society that involve risk and uncertainty.

## Center Has Methodological Core

The center is organized so that a methodological core provides the central conceptual structure and interacts with six technical satellites that address specific technological problem areas. The core consists of basic research clusters dealing with risk quantification, preference measurement, and decision processes; it also has two "aspect-oriented" clusters (one on financial and project risk management and the other on legal liability and insurance) that provide more specialized support.

The six satellites are (1) advanced materials, (2) decisionmaking in health care, (3) design, manufacturing, and process control, (4) environmental

systems, (5) power generation and nuclear technologies, and (6) transportation.

## Research Plans

The center plans to pursue research in software reliability analysis; risk analysis in command, control, communication and intelligence; risk-based engineering design; environmental issues, including hazardous waste disposal and superfund sites; risk analysis in the evaluation of environmental health problems and pharmaceutical practices; risk management in manufacturing operations; material failures and risk management; risk in power generation and exposure to nuclear radiation; risk in transport of chemicals and hazardous materials; and airport landside and airside reliability problems, including risk analysis of safety, security, and transportation infrastructure.

The university's Schools of Engineering and Applied Science, Law, and Medicine will all be participating in the center, as well as the Colgate Darden Graduate School of Business Administration, the College of Arts and Sciences, the Center for Public Service, the Light Metals Center, the Institute of Environmental Negotiation, and the Center for Computer Aided Engineering.

The address of the center is as follows: University of Virginia, Center for Risk Management of Engineering Systems, Thornton Hall, Charlottesville, VA 22901 (Telephone 804-924-3803, -924-0960).

## Computer Aided Environmental Management Course Offered

SRA is cosponsoring the First Annual Conference on Computer Aided Environmental Management, which is to be held June 21-22 at the Grand Hyatt New York Hotel in New York City. Offered by the Northwest Center for Professional Education, it is designed to help companies comply with government requirements on environmental information and at the same time assemble and use the data to the benefit of the company itself. Materials Safety Data Sheets and compliance with OSHA, RCRA, CERCLA, SARA Title II and other statutes will be addressed, as well as risk analysis and emergency response requirements. Joseph Fiksel, SRA's treasurer and program manager of Risk and Decision Systems at Teknowledge, will be the program moderator. (For additional information, call 1-800-426-5575.)

## Comings & Goings

**Eric Hans Bauman** has been appointed manager of occupational safety and health at Edison Electric Institute (EEI), the association of investor-owned electric utilities, in Washington, DC. In that position he will be responsible for regulatory affairs, technical assistance, and member communications for workplace safety and health issues. Prior to joining EEI, he was a senior associate with Environ Corporation, Washington, DC, and was supervisor of environmental planning with Cooperative Power, Minneapolis/St. Paul, Minnesota.

### NOTICE:

The telephone number given in the last newsletter for President-Elect Richard E. Schwing was his home number. His business number is 313-986-1348.



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*Society Secretariat:* Richard J. Burk, Jr., Executive Secretary, Society for Risk Analysis, 8000 Westpark Drive, Suite 400, McLean, VA, 22101 (Phone: 703-790-1745).

*Note:* Contributions to the newsletter should be mailed to one of the following addresses:

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## Letter from the Editor

*Dear SRA Members:*

*Several of you have mentioned the difficulty you have in reaching me by telephone. I hope to have full telephone coverage in the not too distant future, but currently I am the only full-time employee of my business (Tec-Com) and I make frequent trips to the typesetter, printer, etc., as well as occasional out-of-town trips. Also, my office hours tend to be late morning to late evening. If you cannot reach me at my office (615-482-4640), do not hesitate to call my home (615-689-5315). I am still considering the suggestion that I at least get an answering machine, but I admit to an intense dislike of being answered by a machine when I make a long-distance call. (On the other hand, I recognize that I would not be getting some of my messages to you if you did not have answering machines.)*

*On another subject: Please put me on your mailing list! I want very much to keep the membership informed about Society activities, and it is extremely helpful to receive regular communications from the various chapters and committees. (Some of you are doing a great job, but you should also notify me when you have a change of plans—e.g., a change in the date of a meeting.) Also, I would like to have a Comings & Goings column in every issue, and for that I need to be notified of your job changes. Similarly, I need to know about special awards and appointments.*

*Finally, I have been asked by some members to let my office serve as a repository for humorous cartoons that would be appropriate as attention-getters in otherwise serious talks on the subject of risk. (I know this is a risky subject.) I am willing to give it a try, and if you have discovered such cartoons, you might send them to me, along with the identification of the sources.*

Lorraine S. Abbott

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