

# RISK *newsletter*

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## Organizational Structure Debated by SRA Members

Except for the engineers, who were meeting separately, SRA members attending the Society's 1990 Annual Meeting in New Orleans rejected with unexpected unanimity the Executive Committee's proposal to set up divisions within the Society, especially along disciplinary lines. After considerable debate, however, it was apparent that a majority of those attending what had been scheduled as a division organizational meeting following the Society's Monday evening business meeting were not opposed to the formation of informal groups that would focus on particular issues or problems.

The tone of the meeting was set early when Steve Rayner, Oak Ridge National Laboratory, who had been asked to chair the organization of the Social Sciences Division, instead proposed elevating the Global Risk Analysis Section to divisional status and also forming a Risk Communication Division. Suggestions for divisions on exposure assessment and behavior patterns were made from the floor, as well as for an engineering division, which was one of those originally proposed by the Executive Committee.

Catherine St. Hilaire, Hershey Foods Corporation, who had been asked to chair the organization of a Health Division, said she had expected exposure assessment to be part of the Health Division or possibly a Health Risk Assessment Division.

SRA President Curtis Travis agreed that he had been thinking more in terms

*(Continued on page 12.)*

### Council Approves Formation of Five Special Interest Groups

Meeting in New Orleans on Tuesday evening, October 9, the new 1990-91 SRA Council responded to the wishes of the membership and approved the formation of five "special interest" groups within the Society. The five are identified as (1) Global Risk Analysis, (2) Exposure Assessment, (3) Risk Communication, (4) Engineering, and (5) Space. The following reports were submitted by these groups.

**Global Risk Analysis.** *Chaired by Rob Coppock, National Academy of Sciences, 2101 Constitution Avenue, Northwest, Washington, D.C. 20418 (Phone 202-334-1637, FAX 202-334-1597).*

Sixteen persons attended the scheduled Tuesday evening meeting of the Global Risk Analysis Section, which by action of the 1990-91 SRA Council is now called the Global Risk Analysis Interest Group. Rob Coppock, chair of the group, discussed the need for decisions on the directions the group would be taking and volunteered to collate the ideas of the various members for circulation in January. In response to a request from President-elect Warner North, the group will organize a session for the 1991 SRA Annual Meeting. Volunteers assisting Coppock during the year will be Abe Bernstein, Janice Longstreth, and Jerry Chandler. Chandler will be producing the group's newsletter, for which he is soliciting articles on global risk analysis, ecology, health, etc. by February 15. Contributions should be mailed to him at: Epilepsy Branch, National Institute for Neurological Disorders and Strokes, National Institutes of Health, Room 121, Federal Bldg., 7750 Wisconsin Ave., Bethesda, Maryland, 20892 (Phone 301-496-1846; FAX 301-496-9616).

**Exposure Assessment.** *Chaired by Paul Price, American Petroleum Institute, 1220 L Street, Northwest, Washington, D.C. 20005 (Phone 202-682-8477; FAX 202-682-8031).*

Eleven persons met at the Tuesday banquet of the SRA Annual Meeting to discuss the formation of a special interest group on exposure assessment. The group identified specific topics of interest and discussed possible activities for the group. Exposure topics identified included

*(Continued on page 5.)*

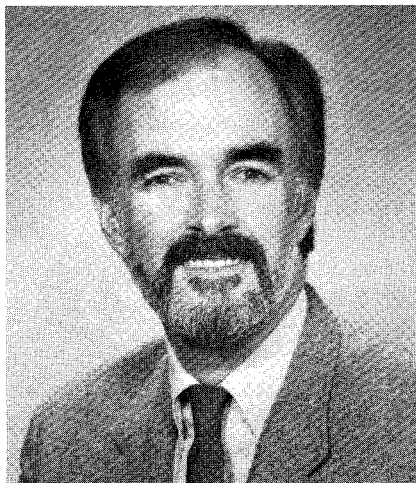
## Results of 1990 Elections Announced

The results of the 1990 elections of a new president-elect and three councilors were announced during the business meeting at the SRA Annual Meeting in New Orleans. D. Warner North of Decision Focus Incorporated in Los Altos, California assumes the office of president-elect. He will also chair the Annual Meeting Committee. The new councilors, who will serve three-year terms, are Ann Fisher of the Department of Agricultural Economics and Rural Sociology at The Pennsylvania State University in University Park, Pennsylvania; Saburo Ikeda of the Institute of Socio-Economic Planning at The University of Tsukuba in Japan; and David B. McCallum, deputy director of the Center for Risk Communication at Columbia University and director of its Washington, D.C. program.

### D. Warner North

SRA President-elect Warner North graduated from Yale University in 1962 with a B.S. in physics. He subsequently attended Stanford University, where he earned M.S. degrees in physics (1963) and mathematics (1966) and a Ph.D. in operations research in 1970. His professional experience has been in contract research and consulting involving decision and risk analysis at SRI International from 1967-77 and at Decision Focus Incorporated from 1977 to the present. He has also been a consulting associate professor (1976-88) and consulting professor (1988 to present) in the Department of Engineering-Economic Systems at Stanford University, as well as the associate director of the Stanford Center for Risk Analysis since 1988.

North has served on several committees of the Science Advisory Board of the U.S. Environmental Protection Agency and is currently a member of the National Academy of Sciences—National Research Council's Committee on Risk Assessment Methodology. In addition, he has been a participant in four NAS-NRC studies, including the 1989 study on improving risk communication. He was a member of the California Governor's Scientific



**D. Warner North**

Advisory Panel for Proposition 65 during 1987-89 and was a Presidential appointee to the Nuclear Waste Technical Review Board in 1989-90, chairing the Risk and Performance Analysis Panel.

Having served as an SRA councilor (1985-89), as the first president of the Northern California Chapter, and as a member of the editorial board of the Society's journal, North sees the SRA not only as a "flourishing forum for interchange within our professional community" but also as "bringing the insights achieved within our community to other scientists and engineers, to the leadership of governmental and business organizations, and to a public that is increasingly concerned about the risk issues we study." With a background from a variety of risk issues on which he has worked, including natural disasters such as hurricanes and wildland fires, biological quarantine for the U.S. space program, toxic chemicals, energy policy and energy research and development, global climate change, and disposal of high-level nuclear waste, North also feels that he can help "to promote synergism and consensus among the various elements within SRA."

### Ann Fisher

SRA Councilor Ann Fisher attended the University of Connecticut and earned a B.A. with honors in mathematics

(1967) and an M.A. (1973) and a Ph.D. (1973) in economics. Her major fields were microeconomic theory and mathematical and environmental economics. From 1971-1983 Fisher taught at the State University of New York College at Fredonia, where she received the Chancellor's Award for Excellence in Teaching in 1975. From 1980-87 she was a senior economist for the Benefits Branch of the U.S. Environmental Protection Agency and became manager of EPA's Risk Communication Program in 1987. While at EPA, she received the agency's Special Achievement Awards from 1985 through 1989 and the Bronze Medal in 1990. She left the EPA late in 1990 to accept her current position at The Pennsylvania State University.

Fisher is a member of several economic associations, including the Association of Environmental and Resource Economists, for which she chaired the Nominating Committee in 1983 and has served on the Annual Workshop Planning Committee for the past five years. In the SRA, she served as general meeting and program co-chair for the 1990 Annual Meeting in New Orleans and organized the Risk Communication Roundtable sessions for that meeting. In addition, she is helping to organize the new SRA special interest group on risk communication [see article in this newsletter].

### Saburo Ikeda

Councilor Saburo Ikeda obtained a B.S. (1963) and M.S. (1965) in Applied Mathematics and Physics and a Ph.D. (1974) in Control Theory at Kyoto University in Japan. He began his professional career as a research engineer at the chemical company Showa Denko (1965-72), later becoming a research associate in the Department of Applied Mathematics and Physics at Kyoto University (1972-82). During this period, he was a research scholar at the International Institute for Applied Systems Analysis (1976-77) and a visiting fellow at the Imperial College of Science and Technology of London University (1980-81). He joined The

University of Tsukuba as an associate professor in 1982, becoming a full professor in 1987. From 1986-87 he was a Fulbright Scholar at Clark University in Worcester, Massachusetts.

Ikeda's field is system analysis in urban, regional, and environmental systems. He has served as secretary and councilor of SRA-Japan since its inauguration in June of 1988. In addition to his membership in SRA, Ikeda is also affiliated with IEEE (Society of System, Man and Cyben.), the Regional Science Association of Japan, and the Japanese Society of Agricultural Systems.

### David B. McCallum

Councilor David B. McCallum received a B.S. in chemical engineering from North Carolina State University and an M.S. in chemical engineering and a Ph.D. in biomedical engineering from the University of Virginia. He is currently deputy director of the Columbia University Center for Risk Communication and director of its Washington, D.C. program. He is involved in research, analyses, consultation, and dissemination efforts aimed at understanding the flow of information on personal and environmental health issues among

scientists, practitioners, journalists, and consumers.

McCallum formerly served as a senior analyst in the U.S. Congress' Office of Technology Assessment and in a number of other government and private agency posts. Prior to accepting his present position, he developed and directed the program on Risk Communication at Georgetown University Medical Center. His SRA activities include serving on the Workshop Committee from 1988 to 1990, reviewing articles for *Risk Analysis*, and making presentations and serving as a panelist at the annual meetings.

## 1990-91 SRA Officers and Councilors

The names and addresses of the SRA officers and councilors for 1990-91 are as follows:

**President:** Curtis C. Travis, Office of Risk Analysis, Health & Safety Research Division, Oak Ridge National Laboratory, M/S 6109, Building 4500S, Room S204, P.O. Box 2008, Oak Ridge, Tennessee 37831-6109 (Phone 615-576-2107; FAX 615-574-9887; FTS 626-2107; Secretary [Denice Henderson] 615-576-2109).

**President-Elect:** D. Warner North, Decision Focus Incorporated, 4984 El Comino Real, Los Altos, California 94022 (Phone 415-960-3450; FAX 415-960-3656; Secretary [Sheila Mattaliano], 415-960-3923).

**Secretary:** Vlasta Molak, Bio-Technology Forum, Inc., 8987 Cotillion Drive, Cincinnati, Ohio 45231 (Phone 513-533-8334; FAX 513-533-8560).

**Treasurer:** Raymond F. Boykin, California State University, Chico, College of Business, Chico, California 95929-0011 (Phone 916-898-5895; FAX 916-898-6824; Secretary [Geri Drivon] 916-898-6463).

**Immediate Past President:** B. John Garrick, PLG, Inc., 4590 MacArthur

Bld., Suite 400, Newport Beach, California 92660-2027 (Phone 714-833-2020; FAX 714-833-2085; Assistant [Marcia Lawson] 714-833-2020).

**Executive Secretary:** Richard J. Burk, Jr., 8000 Westpark Drive, Suite 130, McLean, Virginia 22102 (Phone 703-790-1745; FAX 703-790-9063).

**Councilor, 1991:** Joellen Lewtas, Health Effects Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711 (Phone 919-541-3849; FAX 919-541-0694).

**Councilor, 1991:** Catherine St. Hilaire, Hershey Foods Corporation, Corporate Administrative Center, Government Relations Department, P.O. Box 814, Hershey, Pennsylvania 17033-0814 (Phone 717-534-7547; FAX 717-534-7319).

**Councilor, 1991:** James D. Wilson, Monsanto Company, 800 N. Lindbergh Boulevard, St. Louis, Missouri 63167 (Phone 314-694-8879; FAX 314-694-6858).

**Councilor, 1992:** R.A. (Tony) Cox, Four Elements Limited, 25 Victoria Street, London SW1H 0EX, England

(Phone 011-44-1-233-1088; FAX 011-44-1-233-2152).

**Councilor, 1992:** Peter Barton Hutt, Covington & Burling, 1201 Pennsylvania Avenue NW, Washington, DC 20004 (Phone 202-662-5522; FAX 202-662-6291).

**Councilor, 1992:** Roger E. Kasperson, Center for Technology, Environment, and Development, Clark University, 950 Main Street, Worcester, Massachusetts 01610 (Phone 508-793-7665; FAX 508-793-7780).

**Councilor, 1993:** Ann Fisher, Pennsylvania State University, 8 Weaver Building, University Park, Pennsylvania 16802 (Phone 814-865-9541; FAX 814-865-3746).

**Councilor, 1993:** Saburo Ikeda, Institute of Socio-Economic Planning, The University of Tsukuba, 1-1-1 Tennoudai, Tsukuba, Ibaraki 305, Japan (Phone 0298-53-5380; FAX 0298-55-3849).

**Councilor, 1993:** David B. McCallum, Center for Risk Communication, Columbia University, 2121 Wisconsin Avenue NW, Washington, DC 20007 (Phone 202-342-7573; FAX 202-333-6316).

**SRA-Europe****President:** Pieter Jan Stallen**SRA-Europe Secretariat:** Troopstraat 34, 6813 KT Arnhem, The Netherlands.**SRA-Japan****President:** Eizi Yokoyama**Secretary:** Saburo Ikeda (see address on page 3).

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## 1990-91 Committee Chairs and Contact Councilors

**President** Curtis Travis has announced the following committee chairs for 1990-1991:**Annual Meeting:** D. Warner North (see address on page 3).**Awards:** Vincent T. Covelto, Center for Risk Communication, Columbia University, School of Public Health, 60 Haven Avenue, New York, New York 10032 (Phone 212-305-3464; FAX 212-749-3590).**Chapter Liaison & Relations:** Catherine St. Hilaire (see address on page 3).**Conferences & Workshops:** Yacov Y. Haimes, Department of Systems Engineering, University of Virginia, Thornton Hall, Charlottesville, Virginia 22901 (Phone 804-924-0960; FAX 804-982-2972).**Executive:** Curtis Travis (see address on page 3).**Finance:** Raymond F. Boykin (see address on page 3).**Gifts and Grants:** James D. Wilson (see address on page 3).**Governance:** Peter Barton Hutt (see address on page 3).**Membership:** W. Gary Flamm, 11760 Indian Ridge Road, Reston, Virginia 22091 (Phone 703-620-3572; FAX 703-620-1565).**Nominations:** Richard C. Schwing, Operating Sciences Department, General Motors Research Laboratories, 30500 Mound Road, Warren, Michigan 48090-

9055 (Phone 313-986-1348; FAX 313-986-0128).

**Publications:** B. John Garrick (see address on page 3).**Publicity:** Hatice S. Cullingford, SN, 2101, NASA Road 1, Houston, Texas 77058 (Phone 713-283-8229; FAX 713-283-5818).**Sections and Chapters:** Chris G. Whipple, Clement International, 160 Spear Street, San Francisco, California 94105-1535 (Phone 415-957-0110).**Society Liaison:** James D. Wilson (see address on page 3).**Subcommittee on International Relations:** Vlasta Molak (see address on page 3).**Historian:** Vincent T. Covelto (see address above).

Contact councilors are members of the SRA Council who have been assigned to represent the SRA committees at Council meetings. For 1990-91, the committee chairs who are also members of the Council have been designated as the contact councilors for their committees. The contact councilors for committees not chaired by Council members are as follows:

**Curtis C. Travis:** Membership and Nominations Committees.**B. John Garrick:** Sections and Chapters Committee.**Ann Fisher:** Awards Committee.**David B. McCallum:** Conferences and Workshops, Publicity, and Historian Committees.

### Thank You

The Society for Risk Analysis expresses appreciation to the following outgoing officer and councilors:

*From the Executive Committee*  
Richard C. Schwing  
1988-89 President

*From the Council*  
George Apostolakis  
W. Gary Flamm  
Richard Wilson

### NSF Funding Opportunities Presented

Robert F. Bordley, one of the 1990-91 program directors for the Decision Risk and Management Science Program (DRMS) of the National Science Foundation (NSF), described the funding opportunities available through DRMS at the 1990 SRA Business Meeting in New Orleans.

The NSF was organized in 1950 to initiate and support basic scientific research and programs, the median annual award being about \$65,000. The overall objective of the DRMS Program is to build an interdisciplinary science basis for decision making and management. The program supports research directed at increasing the understanding and effectiveness of problem solving, information processing, and decision making by individuals, groups, organizations, and societies. It explores fundamental issues in management science, risk analysis, public policy decision making, judgmental processes, behavioral decision making, organizational design, and decision making under uncertainty. With a budget of \$3 million, 40 new projects out of 250 proposals were selected last year to receive awards ranging from \$5000 to \$50,000. Most of the awards are for one year, but can be extended to three years.

When a proposal is received it is sent to ad hoc reviewers, experts chosen  
(Continued on page 20.)

## Special Interest Groups

(Continued from page 1.)

exposure modeling, exposures from land disposal facilities, dietary exposures, and the cultural aspects of exposure assessment. Possible activities for the group include: chairing sessions of invited papers on exposure assessment topics, organizing a workshop on exposure assessment as part of the next annual meeting, and sponsoring a symposium on exposure assessment in the summer of 1991. If you are interested in participating in the group or suggesting additional topics for consideration, please contact Paul S. Price.

**Risk Communication.** *Chaired by Ann Fisher, Department of Agricultural Economics and Rural Sociology, 8 Weaver Building, The Pennsylvania State University, University Park, Pennsylvania 16802 (Phone 814-865-9541; FAX 814-865-3746).*

Seventeen people expressed interest in organizing informally as a Risk Communication Interest Group (RCIG). As yet having no formal structure, the RCIG could provide a network and a forum in which risk communicators share ideas and data, find research and funding opportunities, and cooperatively advance the field.

To foster initial networking and discussion of the group's potential, RCIG will pursue two activities. The first is a survey of potential members (anyone who is interested in the field of risk communication and is a member of SRA) to see what they would like to happen within the field of risk communication and within the interest group. Anyone is welcome to "apply" (by March 1, if possible) for a form from Kandice Salomone, Environmental Communication Research Group, Rutgers University, Box 231, Cook College, New Brunswick, New Jersey 08903-0231 (Phone 908-932-8795; FAX 908-932-7815), or Thomas Hatfield, Department of Health Science, California State University, Northridge, California 91330 (Phone 818-885-4708; FAX 818-885-4545).

A second effort is devoted to clarifying what, if any, conceptual framework underlies risk communication research and practice. Answers to the following questions are sought: (1) *What risk communication or risk perception theory, if any, underlies risk communication research and/or practice?* (Optional: What obstacles are there to the advancement of theory in risk communication? What are the feasible approaches to such advancement?). (2) *What theoretical concepts/philosophies/ideologies underlie risk communication research and/or practice?* (Optional: Why? [e.g., advantages over other approaches; evidence that your approach works]). (3) *What risk communication issues are not being addressed adequately, or at all, by risk communication theorists and/or practitioners?* Please send your responses by May 1 to Branden Johnson, Risk Communication Unit, Division of Science and Research, New Jersey Department of Environmental Protection, CN 409, Trenton, New Jersey 08625 (Phone 609-633-2324; FAX 6-9-292-7340).

The results from both these efforts will be presented at the 1991 SRA Annual Meeting, at which time the future of RCIG will also be discussed. Recent issues of *Risk Analysis* reflect that many disciplines are now working on risk communication, at least in part because many managers and policy makers now realize the importance of communicating about the risks they create or manage. The 1990 SRA Annual Meeting had five sessions comprising the Risk Communication Roundtable and nine additional risk communication sessions. Because of the interest shown in these sessions, the U.S. Environmental Protection Agency plans to organize followup Risk Communication Roundtable sessions for the 1991 Annual Meeting. [Note: Copies of reports from SRA's 1990 Risk Communication Roundtable are available from: Ernestine Thomas, Risk Communication Program, PM-221, U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460 (Phone 202-382-5501).]

**Engineering.** *Chaired by Bill Gekler, PLG, Inc., 4590 MacArthur*

*Blvd., Suite 400, Newport Beach, California 92660-2027 (Phone 714-833-2020; FAX 714-833-2085).*

Twenty-four persons attended the organizing meeting of the SRA Engineering Division, now designated as the Engineering Interest Group. The meeting on October 8 accomplished its goals as prepared by Bill Gekler, organizing chairman for 1990-91. Hatice Cullingford was elected as the organizing secretary for 1990-91, with other positions to be filled during the 1991 elections. A charter will be initiated for the Engineering Group by Bill Gekler, who will work with the following volunteers: Jon Young, Rob Myers, Fritz Seiler, Yacov Haimes, and Hatice Cullingford. Four sessions and organizational volunteers were identified for the 1991 Annual Meeting: (1) Nuclear Waste: Warner North; (2) Global Climate and Energy Policy: Istvan Bogardi and others; (3) Clean Air Act: Rob Myers and Bill Gekler; and (4) Infrastructure Issues: Van Wilkinson and Yacov Haimes. Nominations of officers for 1991-92 were postponed until the group's charter and organizational structure are determined. SRA members interested in joining the group should contact Gekler or Cullingford (see address below).

**Space.** *Chaired by Hatice Cullingford, SN, 2101, NASA Road 1, Houston, Texas 77058 (Phone 713-283-8229; FAX 713-283-5818).*

The year 1991 is expected to be a very important year for future space activities because of several high-level government reviews in progress now. Lunar and Mars exploration plans are expected to be specified along with a major technology development program. Upon the request by President Curtis Travis, a special SRA interest group for space issues is being organized and will sponsor two space-related sessions for the 1991 SRA Annual Meeting. Those SRA members who are interested in risk-based approaches to space activities are requested to make their interest known to Cullingford.

# Report from SRA 1990 Annual Business Meeting

[The following report was written by newsletter staff.]

President Garrick opened the Monday evening business meeting by calling on President-elect Curtis Travis, who had served as chairman of the Annual Meetings Committee, to present attendance statistics on the 1990 meeting. At the end of the first day, 371 had registered, compared to a total of 490 in San Francisco the previous year. Travis pointed out that about a 10% cancellation had occurred because of last-minute government travel restrictions, which also prevented the presentation of a number of scheduled papers. The New Orleans program initially included approximately 40% more papers than the San Francisco program and even with the cancellations, the number of papers presented at the 1990 meeting was higher than for any previous meeting.

## Journal Report

As editor of the Society's journal, *Risk Analysis*, Travis reported that during 1989 the number of paper submissions to the journal had increased by about 50% and during 1990 the increase was even higher. The acceptance rate is about 30%, with approximately 15 papers published in each of the four issues per year. SRA is negotiating with Plenum Publishers (or possibly another publisher) to increase the number of issues to six in 1992, which would allow a higher acceptance rate. Even now, Travis said, the Society is publishing about 150 pages more than those specified by its contract.

Travis feels that *Risk Analysis* has become the premier journal in risk assessment and that it is making inroads into other areas—in toxicology and the social sciences, for example. The submissions by engineers, however, have consistently decreased over the years, which is a trend that Travis thinks should be reversed. "There is a large engineering component that should be in our Society now and isn't," he said.

## Elections and Membership

SRA Secretary Vlasta Molak presented the election results (see page 2) and reported that as of October 4, the Society had a total of 1703 members, which is to be compared with 1538 last year. (The membership numbers published in the September 1990 issue of the newsletter totaling 1962 apparently included some who are no longer members.)

## Budget

Treasurer Raymond F. Boykin showed a slide of the audited revenues and expenses for 1989, pointing out that the revenues were approximately \$260,000 while the expenses were a little over \$273,000. He attributed the deficit to catching up on the costs of the belated production of annual meeting proceedings (1986 through 1989), only some of which had been budgeted for. These expenses will also appear in 1990 and, at a lower level, in 1991.

On the positive side, SRA workshops are bringing in \$35,000 to \$40,000 per year and incurring expenses of only about \$24,000. Journal royalties also are up, and the 1989 Annual Meeting had a profit of \$20,000. On the other hand, the costs of publishing the journal and the newsletter continue to increase.

The balance sheet for the end of August showed that the Society had \$75,000 in the bank (checking account plus money market account). Some of this money is marked for end-of-year expenses, however.

Boykin pointed out that the Society dues had remained at \$50 for four years and that the Council might vote during the New Orleans meeting to increase them. [Editor's Note: The 1990-91 Council, meeting for the first time on October 9, voted to increase the dues to \$60 for a full membership and to \$35 and \$10 for students with and without receipt of the journal.]

Responding to a question as to whether the registration fees and hotel costs for the Society's annual meetings could be reduced, Boykin said the planning committees are faced with several problems. First, they

must plan a budget to break even. (Annual meeting profits usually arise from unanticipated corporate gifts.) The biggest problem is finding a hotel with enough meeting rooms and being able to ensure that a sufficient number of attendees stay at the hotel to obtain the meeting rooms at no cost. In New Orleans, to avoid a \$10,000 cost for meeting rooms, the Society had to guarantee the use of 200 rooms.

Another speaker addressed the annual meeting registration fee of \$90 for graduate students, stating that "we should consider something as drastically different as \$25 to encourage students to come."

## Meeting Locations

President Garrick announced that the 1991 SRA Annual Meeting would be held in the Washington area (see Call for Papers on page 21). The intent is to move it away from October "which conflicts with the startup of school, the U.S. budget cycle, and, it seems, with earthquakes and Midwest crises." The two weeks following Thanksgiving were being considered.

The 1992 meeting will be held either in San Diego or in Vancouver and the 1993 meeting probably will be held somewhere in the southeast, perhaps in South Carolina, Georgia, or Florida, although bids by active chapters for hosting meetings will be seriously considered.

## Chapters and Divisions

Garrick announced that at the last meeting of the 1989-90 Council, held in New Orleans on October 7, the Rocky Mountain Chapter had been recognized as an official SRA chapter (see story on page 18).

Garrick also talked about SRA's hope for establishing divisions within the Society oriented toward disciplines, as opposed to chapters and sections that are organized by geographical areas within and outside the U.S., respectively. He, as Travis had earlier, voiced concerns about the decreasing participation of engineers within the Society. He urged all those present to attend one of the division organizational meetings following the business meeting. [Editor's Note: See page 1 story for results of those meetings.]

## Awards

Garrick next presented the Society's Outstanding Service Award to Chris Whipple

## Proceedings Update

Camera-ready pages for the 1989 proceedings (meeting in San Francisco) were turned over to Plenum Publishers by Tec-Com in October 1990; the expected publication date is March 1991. Camera-ready pages for the 1988 proceedings (in Washington, DC) should be completed before June 1. All earlier proceedings have been published and may be ordered by mailing a check for \$45 made out to Plenum Publishing Corp. to:

Plenum Publishing Corp.  
ATTN: Mary Safford  
233 Spring St.  
New York, New York 10013

of Clement International and Howard Kunreuther of The Wharton School of the University of Pennsylvania for services outlined in RISK newsletter, September 1990. A third recipient, Pieter Jan Stallen of Amsterdam, Holland, was unable to attend the meeting (see page 15).

Garrick reminded the audience that Professor Norman Rasmussen had received SRA's 1990 Distinguished Contribution Award during the Plenary Session and announced that W. Glenn McGregor of the Carcinogenesis Laboratory of Michigan State University had been selected by the Society to receive the Chevron Postdoctoral Risk Analysis Research Fellowship at the Tuesday luncheon (see page 11).

### Society Fellows

Garrick reported that the naming of Society fellows had been delayed until the Council had determined the right specifications for what constitutes a fellow. The Awards Committee headed by Paul F. Deisler, Jr. had done "an outstanding job of researching the fellow concept and has given us a great deal of guidance on what makes sense for this type of society." One of the reasons action had been withheld, Garrick said, was that input was still being received from a number of members and that they, as well as the Council, feel that it is extremely important that, in addition to making outstanding contributions in his or her chosen field, the honoree should be an important force in the Society itself.

### NSF Presentation

Garrick introduced Robert F. Bordley, new program director for the Decision Risk and Management Science Program in the National Science Foundation, who discussed the NSF program for supporting research (see page 4).

### Outgoing Officers

Garrick next welcomed the newly elected president-elect and councilors and expressed gratitude to those who had completed their terms in office: Richard Schwing, 1988-89 president, and three councilors, George Apostalakis, Gary Flamm, and Richard Wilson.

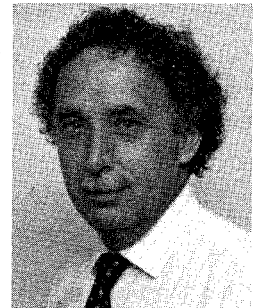
### Comments from the Floor

Asking for comments from the floor, Garrick recognized Jerry Chandler of the National Institutes of Health, who protested against the Council's decision not to publish proceedings for the 1990 meeting, saying that he and other session chairs had been embarrassed by having to notify their speak-

## President's Goals

*(The following remarks were made in New Orleans by President Curtis C. Travis shortly after receiving the gavel from outgoing President John Garrick.)*

As the new president, I want to discuss several goals that I think the Society should have during the coming year. The first one is the formation of divisions. I think it is important for the future of the Society to have divisions, and I think they should be formed around issues like global climate change or risk communication or exposure assessment. That will give people in the various disciplines a place to work within the Society. I also think we need more outreach to additional disciplines.



Curtis C. Travis

Second, I think we need a modest effort in trying to increase our membership. I'm thinking in terms of a 10% increase. Historically, we have been gradually increasing in number, and we need to ensure that that continues. We need to add 200+ members this year.

Third, we need to support the formation of more local chapters and encourage their activities and input into the Society.

We also need to work at having better annual meetings. The responsibility for organizing the 1991 meeting goes to Warner North, but having had that responsibility myself this year, I think I can offer a few suggestions. One is to try to get more workshops in front of the meeting. Forty people signed up for one of our workshops this year, and I think they all felt it was worthwhile. As you saw in our budget, we generate nearly \$40,000 per year from our various workshops, and we should be holding more nationally, and particularly at annual meetings.

Finally, we need to get other societies, such as the American Nuclear Society, the Health Physics Society, and the Society for Toxicology, involved in our meetings. That shouldn't be too difficult and it would promote the concept of an interdisciplinary interaction which we all feel makes the Society for Risk Analysis unique.

—Curtis Travis  
1990-91 President

ers of the decision at a very late date. Garrick pointed out the Council's frustrations in not being able to publish the proceedings in a timely manner and in having to underwrite their large expense; he added, however, that the Council was still open to ideas from the members on the subject. Chandler asked that an ad hoc Committee be appointed to study the matter and report to the Council. Garrick said the suggestion would be placed on the Council's agenda for the Tuesday evening meeting.

A second comment from the floor was from a first-time attendee who was disappointed at the failure of a number of scheduled speakers to appear and also felt that the lengths of the sessions should be standardized. Garrick said the program committees were constantly wrestling with both problems, which were complicated by the Society's philosophy that it would accept most, if not all, papers submitted, and therefore must run concurrent sessions.

### Transfer of the Gavel

The business concluded, Garrick welcomed Curtis Travis to the presidency and handed him the gavel. Travis, in turn, presented Garrick with a plaque recognizing his services to the Society. Commending Garrick, Travis said: "He has done an outstanding job as president. He has also done the field of risk assessment a great service in that he's a strong and credible national advocate for risk assessment. He's on many committees, from the state level to the international level. Within the Society, he has brought forth the concept of forming divisions, and he has worked endlessly to get more engineers involved in the Society. Finally, he has never failed to respond when I send him an engineering paper to review for the journal."

The meeting was concluded with comments from the new president (see box above).

# Nuclear, Acid Rain, and Asbestos Risks Discussed

## Rasmussen Summarizes "The Challenges That Remain"

MIT Professor Norman Rasmussen, the recipient of SRA's 1990 Distinguished Contribution Award, spoke during the Plenary Session of the 1990 SRA Annual Meeting on "Risk Assessment: The Challenges That Remain."

Rasmussen began his address by emphasizing that most of his risk assessment work had been for large engineered systems, primarily nuclear reactors, with some additional efforts on liquid natural gas systems and NASA projects. Within his experience, he summarized the challenges remaining in risk assessment to be the following:

(1) *Reducing uncertainty in our results.* ("Nuclear risk is dominated by radioactivity. You can have 30 billion curies in a reactor and anything that is a billion is a lot. But to estimate health effects we have to figure out how the fuel might melt and then how it gets outside the containment and presents health effects.... We will probably be able to reduce uncertainty some, but not a whole lot because we do not know a lot about how the melting occurs.")

(2) *Conveying the meaning of our results.* ("No matter whether you say something might happen next century, next year, or next week, the response from the public will be 'That's just too often for me.' By the time you get down to  $10^{-4}$ , you are in a region that is not understood. When you start comparing it with [common] ways people could lose their lives, they think you are trivializing it.")

(3) *Setting a de minimis probability.* ("We must develop a de minimis probability....It is the level at which you cut off your analysis because you think it is not meaningful to go further.")

In conclusion, Rasmussen said we also must understand the limitations of risk analyses. He cited the application of risk analysis to the waste disposal problem as an example. "I have trouble with the long-term aspect." He argued that not enough is known about underground water level movements, climate changes, etc. to predict reactivity levels in one million years. However, it can be pointed out that the material dug up to make nuclear fuel already has long-lived alpha emitters. "We dig it up and refine it and [after we use it] we are left with actinides which after 1000 years have a toxicity to society that is not much different from the ore we dug up in the first place. I do not claim

that I know where it is going to be in 1000 years. But I can say the engineers put it far away from ground water and I can say they put it in a much less soluble form."

A member of the audience spoke up to say "If that were true there would not be an argument about nuclear waste, so it just cannot be true." Rasmussen responded by saying that our ultimate challenge is centered around the way our society works. "[We have] strong dislikes and paralyzing fears about any activity that entails risk. Projects are so costly and our systems for dealing with people so involved that in the end we reach agreements that are against logic. We spend and squander our resources to defend ourselves against phantom risks."

Rasmussen gave a Three Mile Island example: The city of Lancaster, Pennsylvania would not give permission for water from the cleanup to be trucked out because it still contained some radioactive tritium, although it met drinking

water standards in every other respect. The compromise was to go through a costly process of boiling the water and releasing the tritium directly into the atmosphere.

"We must," he concluded, "bring rationality back into our discussion."

Note: Rasmussen was the leader of the first major

U.S. study of nuclear power reactor safety, which was reported in 1975 in WASH-1400 (the "Rasmussen report"). "During those early days," John Garrick says, "he gave us all considerable hope and direction."

## Russell Reports on 10-Year Acid Rain Study

Speaking at the Tuesday luncheon of the 1990 SRA Annual Meeting, Milton Russell, former assistant administrator at the EPA and now in a dual appointment at the University of Tennessee and Oak Ridge National Laboratory, reported on the results and lessons learned from the National Acid Precipitation Assessment Program (NAPAP), for which he chaired the Oversight Review Board. He expressed surprise at how little attention NAPAP had received, given the fact that it was a 10-year-long, \$537 million risk analysis project.

Russell said that NAPAP, which was ending in December, represented one of those rare cases in which Congress chose to commission a research and assessment

*"The megalesson is that it is important to get the research done before positions are taken."—Milton Russell*

*"We reach agreements that are against logic."—Norman Rasmussen*

*"These expenditures have financially devastated school systems."—Brooke Taylor Mossman*



program before acting. In the late 1970s, there was a lot of ignorance about acid rain but many people had strong opinions and risk management decisions were being made on what was thought to be the case at that time. On the one side it was argued that early and massive reductions in SO<sub>2</sub> emissions from coal-fired power plants were necessary to protect ecosystems and public health. On the other side, it was argued that the damaging effects were exaggerated and, in any case, that the 1977 Clean Air Act was already reducing SO<sub>2</sub> enough.

In the midst of this, President Carter in 1980 proposed an ambitious 10-year program to study acid rain, and Congress, led by Senator Patrick Moynihan, agreed to it. In spite of this, acid rain became one of the environmental issues of the decade, with congressmen posing by dying trees and Europe and Canada calling for everyone to join the "30% club," ignoring the fact that the U.S. had already reduced its emissions by 25% since 1977.

Throughout all this time, NAPAP was quietly going on. About 2000 scientists yielded 27 State-of-the-Science/Technology reports and innumerable peer-reviewed articles. And in what was probably the largest review conference on record, 700 scientists from 34 countries met to examine the risk work that was done.

The final conclusion was that man-made acid rain has had some harmful effects on a limited number of lakes and streams and on some structural materials in some parts of the United States. Also, about 1/10 of 1% of the Eastern forest is susceptible to damage, and SO<sub>2</sub> and NO<sub>x</sub> emissions have lowered visibility and contributed to regional haze, especially in the east. There are no negative effects on agriculture, and only speculative effects on human health (research on this is inadequate). Current levels of emission are not likely to greatly increase the size or extent of damage for several decades. Early reductions in SO<sub>2</sub> are possible, but at annual costs of \$4 to \$5 billion. Other atmospheric pollutants, especially ozone, may be even more ecologically damaging and difficult to control. Thus, acid rain is a problem, but not of the magnitude presented by some in the early days. In Senator Moynihan's words, "The sky is not falling but there is no support for complacency and doing nothing." Bills now before Congress are being influenced by the NAPAP results, and Russell feels that the public will be well repaid for the money and time that was spent.

Russell also feels that NAPAP has provided many lessons in the risk management field. The mega-lesson is that it is important to get the research done before positions are taken. Other lessons are: for a project like NAPAP to be undertaken, the problem has to be big enough that it's worth the time and expense; broad political support for a long-time effort is required; the issues to be dealt with should be fluid enough that they are yet to be defined; and the problem should be potentially very divisive, warranting a large program that can provide credibility in the answers. The study should also be focused on a key set of risk

assessment questions, and there should be a proper understanding of the roles of the various participants. The management of the project has to be independent of influence, and communications have to be open and proactive in keeping the public informed. Finally, such a project must have continuous and disciplined oversight and a planned follow-through with respect to documentation, continuity of data bases, etc.

## Mossman Gives Results on Asbestos Health Studies

Brook Taylor Mossman, Wednesday's luncheon speaker at the Annual Meeting, reported that scientific studies and at least seven risk assessments for low-level exposures to the most common forms of asbestos indicate that scarce public funds should not be expended for the removal of undamaged asbestos from schools and other public buildings.

Mossman, associate professor of pathology at the University of Vermont College of Medicine, says that 90 to 95% of asbestos is Chrysotile, which consists of pliable, curly fibers that dissolve in the lungs over time and do not penetrate to the deep lung. The remaining types are amphiboles, which are needle-like fibers and are primarily the types associated with biological effects and tumors.

Three diseases occur from intense occupational exposures to asbestos: asbestosis, a nonmalignant but frequently fatal disease not relevant to low-level exposure; lung cancer tumors, which are rarely found in nonsmokers; and mesothelioma, a tumor originating from cells lining the body cavities that enclose the lung and digestive organs and is not affected by smoking.

Several recent, large-scale surveys show that the levels of airborne asbestos fibers in buildings and schools are less by several orders of magnitude than the current maximum allowable concentration, which itself is much lower than the levels in work places known to have caused disease. Even in buildings with damaged asbestos-containing materials, the average indoor concentrations of airborne fibers are no higher than the outdoor concentrations.

Of the three diseases, only mesothelioma does not have a threshold exposure level below which the disease has not occurred in occupationally exposed workers. Therefore, mesothelioma is the disease to be considered when evaluating health risks due to asbestos exposure in public buildings. But surveys show that mesotheliomas in the public (men under 65 and all women) remain rare and have not increased during the several decades that asbestos has been used in public buildings and homes.

In view of these findings, it is concluded that the almost \$4 billion spent in 1989 for asbestos abatement in public buildings, largely schools that can ill afford the costs, cannot be justified, especially since much more serious environmental and societal health risks exist.

## Starr Receives National Medal of Technology

SRA member Chauncey Starr, president emeritus of the Electric Power Research Institute (EPRI) and a 1984 recipient of SRA's Distinguished Contribution Award, was awarded the National Medal of Technology by President George Bush at a White House ceremony on November 13, 1990. The award recognizes exceptional contributions to the well-being of the nation through the development or application of technology. Starr was cited for his contributions to energy production and policy, particularly his pioneering work in the development of nuclear energy; his development of risk assessment and risk management concepts; his leadership in engineering education; his contributions to a technically trained U.S. work force; and his work in organizing EPRI.



**Chauncey Starr**

Starr has said that he is "a tremendous believer in the ability of technology to improve the welfare of mankind," and his achievements reflect this philosophy. Following World War II, he worked for 20 years at the Atomic International Division of North American Rockwell, which grew from a half-dozen to over 3500 people under his leadership. He received numerous awards for his contributions in the peaceful uses of atomic energy, including the Atomic Energy Commission Award in 1974, the Walter H. Zinn Award in 1979, and the Henry D. Symth Award in 1983.

Starr was Dean of the University of California at Los Angeles (UCLA) School of Engineering and Applied Science from 1966-73 when he developed an analytical approach that he called risk analysis, a method for quantifying societal risks. His ideas became the basis of risk assessment guidelines for the nuclear power industry, as well as for U.S. government agencies such as the Federal Drug Administration and the Environmental Protection Agency. While at UCLA, Starr also made a major impact on engineering education by creating several new departments, including an environmental engineering program and an Institute of Medical Engineering. He also increased the opportunities in engineering for women and minority students.

In 1972, EPRI was founded to manage a technology program for electric utilities to improve power production, distribution, and use. Starr was selected as the founding president and guided its studies to involve "...not only technical specialists but also those deeply concerned with environmental and social impacts...."

At 78, Starr continues to help lead society to advance technology while protecting the environment, concentrating his efforts on global energy policy issues. His recent study, "Global Energy, Electricity Futures, and Climate Change," will be published soon. In the paper, Starr and coauthor Milton F. Searl report that in the year 2060, even if all energy efficiency measures and non-fossil sources are maximized, almost two times the amount of carbon dioxide annually emitted today will be sent into the global atmosphere because of population and economic growth. With the effects of these emissions being uncertain, Starr says, "...the question is 'What do you do about it?'" He plans to continue studies of possible solutions.

### 1990 Sustaining Members

The Society for Risk Analysis thankfully acknowledges the following corporations and institutions which supported the Society in 1990:

American Petroleum Institute  
 Amoco Corporation  
 ARCO Corporation  
 Arthur D. Little, Inc.  
 Clement Associates  
 General Motors Research Laboratories  
 Gillette Company  
 Hoffmann-La Roche *LaRoche*  
 Proctor & Gamble Company  
 Resources for the Future  
 Science Applications International Corporation  
 RiskFocus

### Call for Reviewers

The editor of the SRA journal, *Risk Analysis*, is soliciting volunteers to review papers submitted for publication. If you are interested in serving as a reviewer, please send your name, address, and area of expertise to:

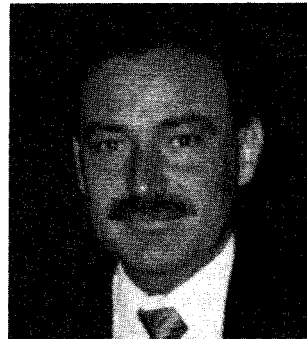
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 P.O. Box 2008  
 Oak Ridge, TN 37831-6109

## Chevron Award Used for Genetic Mutation Studies

The Society for Risk Analysis and Chevron Corporation announced at the 1990 SRA Annual Meeting that W. Glenn McGregor is the first researcher chosen by SRA to receive the Chevron Postdoctoral Risk Analysis Research Fellowship. This two-year (\$88,100) fellowship in either human or environmental risk analysis was instituted as part of Chevron's \$1 million commitment to risk assessment programs at major universities. The commitment was made to encourage outstanding research, develop and improve methodologies for this new discipline, and stimulate talented scientists to enter this new field.

McGregor is a Summa Cum Laude graduate of Michigan State University with a B.S. in biochemistry and a graduate from the University of Michigan Medical School (1981). He obtained clinical training in internal medicine at the University of California, San Francisco Medical School, followed by a research fellowship in the molecular biology of hormonal regulation of genes during fetal development. After a brief period in private practice, he returned to academic medicine by joining the research faculty at the University of Southern California School of Medicine, where he investigated the molecular biology of cell transformation by oncogenic viruses. In 1989 McGregor returned to Michigan State and began working with Veronica Maher and Justin McCormick of the Carcinogenesis Laboratory as a senior postdoctoral research associate.

Within the last five years, excellent methods have been devised for determining the degree to which particular groups of people at risk have actually been exposed to potentially harmful substances in the environment. Except for special cases, however, such as the development of highly unusual forms of cancer (e.g., mesotheliomas linked to asbestos exposure, or instances of extreme levels of exposure such as in the Chernobyl accident), no one can definitively describe the biological importance of such quantitative measurements. McGregor plans to investigate whether exposure to these potentially dangerous substances really results in detectable genetic mutations in the people at risk.



W. Glenn McGregor

By drawing blood and assaying T-lymphocytes for the frequency of cells resistant to 6-thioguanine (TG), it is possible to determine if exposed persons have undergone mutations. TG resistance results from any kind of mutation that eliminates the function of the enzyme HPRT. Yet an abnormally high frequency of these mutant T-cells may result from the clonal expansion of a single mutant T-cell; thus, measurement of frequency must be accompanied by a determination of the kinds and locations of mutations. This process, determination of the spectrum of mutations, particularly of endogenous human genes from finite lifespan cells, has become technically feasible only within the last year.

Thanks to the Chevron fellowship, McGregor will be using this technology to (1) determine the background frequency of TG-resistant mutants and the spectrum of HPRT mutations found in the blood of neonate and "relatively unexposed" adults to serve as a control, (2) determine whether this baseline spectrum differs from the spectrum which occurs spontaneously when cells replicate *in vitro*, and (3) determine the frequency and spectrum of HPRT mutations induced by selected carcinogens/mutagens through treatment of T-cells in culture with benzo(a)pyrenediolepoxide, 1-nitrosopyrene, or formaldehyde. The availability of these baseline spectra, derived from spontaneous mutagenesis, from background "unexposed" populations, and the spectra of mutations found in T-cell populations exposed *in vitro* to specific carcinogens will make it possible to assess the risk involved in *in vivo* environmental exposure. Peripheral blood T-cells obtained from exposed populations or from persons who may have been exposed without knowing it may then be analyzed for the spectra of mutations and compared with the baseline established.

## Comings & Goings

Dale Hattis has joined the Center for Technology, Environment, and Development (CENTED) at Clark University in Worcester, Massachusetts as a research associate professor after 16 years at Massachusetts Institute of Technology, where he engaged in the development and application of methodology to assess the health and economic impacts of regulatory actions. Hattis will collaborate with faculty and

student researchers in the Center's Hazard Assessment Group to extend the Center's capabilities in quantitative risk assessment.

Catherine Petito Boyce recently joined PTI Environmental Services in Bellevue, Washington as a senior toxicologist. She will provide expertise in the areas of toxicology, human health and environmental risk assessment, litigation support, and

project management. Prior to joining PTI, Boyce was the regional office manager for Gradient Corporation's Boulder, Colorado office.

Ralph L. Roberson has been named vice president and director of the Raleigh, North Carolina office of Clement International Corporation. He will work primarily with the company's Systems

(Continued on page 20.)

## Society's Future

(Continued from page 1.)

of issues or problems than disciplines. It was a matter of determining the best organizational structure to encourage the interdisciplinary approach, and also year-long participation in the Society.

**Query on Motivation.** Answering a query as to whether the major motivation of forming divisions along disciplinary lines was to encourage more engineers to join the Society, Travis said that was not the major motivation, although it was an important one. A larger motivation, he said, was to place the Society in a position of national leadership on important issues.

Several voiced their concerns: A division solely focused on an issue should not be allowed to outlive the issue. Issues would dominate the Society, and those not involved would feel left out. Also the interactive character of the Society, especially between disciplines, would disappear. Others, however, felt that asking issue-oriented divisions to help set the annual meeting program would give the meetings more continuity and ensure high-quality papers.

**Identifying Issues.** James Wilson, Monsanto Company, who had been asked to chair the organization of the Policy and Regulatory Analysis Division, suggested that "evolution is better than revolution" and perhaps the Society should take time to identify those issues that would garner the most interest. An audience member, commenting on an earlier suggestion that a division on risk communication should be organized, said that risk communication is a topic that covers many issues and should not itself be the focus of a division.

**A Vote of No, But—** Attempting to find a consensus, Wilson asked all those who would like to see a formal structure of divisions of any type within the Society to stand. No one did. The debate continued, however, with several emphasizing that they were not against informal groups operating within the society.

In the end, most agreed that those who wanted to get together to focus on an issue should have the freedom to do that at SRA annual meetings and be assisted in the promotion of their group. Those wishing to meet during the current annual meeting were urged to utilize the annual meeting bulletin board. Before the 1990 Annual Meeting adjourned, two groups had already met, one on the issue of exposure assessment, led by Paul Price, American Petroleum Institute, and another on risk communication, led by Ann Fisher, The Pennsylvania State University.

## Engineers' Meeting

In the meantime, two-dozen engineers led by Bill Gekler of PLG, Inc., were meeting separately and proceeding under the assumption that divisions would be organized along disciplinary lines.

**Outlining Division Goals.** Gekler named several possible goals for the proposed Engineering Division, including developing an organization with recognized national qualifications to provide guidance on legislation and regulations requiring risk analysis and risk assessment.

Discussing that goal in more detail, Gekler pointed out the increasing number of regulations confronting engineers: the recent OSHA 119 standard, which is similar to risk assessment legislation in California and New Jersey; the new American Petroleum Institute Standard 750 on process safety; and recent amendments to the Clean Air Act.

Concern was immediately voiced that setting up a division might isolate the engineers and destroy the unique character of the Society in providing interactions between the disciplines. Gekler said he saw the division as promoting interaction with other disciplines, and, moreover, as encouraging similar interaction with engineers in other societies. He felt the division could sponsor annual meeting sessions on single topics that would include perspectives from all the disciplines, and such sessions could be cosponsored by other engineering societies. As ex-

amples, he mentioned sessions on Yucca Mountain, a chemical release accident, and the impact of cultures on siting plants in third world countries.

Lorraine Abbott, Tec-Com, Inc., added energy, pointing out that the risks of inadequate energy supplies should be studied as well as the risks of the individual energy systems themselves.

**Selecting Meeting Topics.** Warner North, Decision Focus, Inc., said that as president-elect he was specifically concerned about topics the division could sponsor for SRA's 1991 Annual Meeting. Nuclear waste was certainly an engineering topic that extended into other disciplines, and energy systems and policies could be addressed in conjunction with global climate change. Finally, the substantial impact of the revised Clean Air Act on engineers and others could be a third topic. An audience member added that the U.S. infrastructure is a major national engineering problem that demands attention and entails all sorts of public health, safety, and social risks. Another mentioned a possible session on the interactions of plant managers with local committees.

**Boundaries of the Division.** Outgoing SRA President John Garrick said that while the group should promote integrated approaches to a problem, the boundary of the division itself should be that boundary created by the imposition of engineered systems on our environment and quality of life. "We want to create an environment in which we can engineer systems and make good choices that will allow us to move forward with respect to technical systems coming into service."

The meeting concluded with Hatice Cullingford of NASA, Houston, agreeing to serve as organizing secretary and several others agreeing to work with Gekler on a division charter and goals and also on the development of annual meeting sessions.

*[Editor's Note: Reports from these two meetings resulted in the approval of five special "interest groups" by the SRA Council at its October 8 meeting (see page 1)—LSA.]*

## Directory on Risk Courses Planned by SRA, CENTED

An underwhelming response to previous calls for information on risk and risk-related courses (RISK newsletter, May and September 1989) has not deterred a collaborative effort to produce a directory of such courses. SRA and the Center for Technology, Environment, and Development (CENTED) are taking a new tack to generate the necessary information. In consultation with SRA's 1989 Publications Committee chair and past president, Richard C. Schwing, CENTED researchers Srinivas Emani and Jeanne X. Kasperson have identified a preliminary list of "risk centers," each of which will soon receive a survey:

American University, Institute for Risk Analysis  
 Arizona State University, Office of Hazard Studies  
 Clark University, Center for Technology, Environment, and Development  
 Carnegie Mellon University, Engineering and Public Policy Program  
 Colorado State University, Hazard Assessment Laboratory  
 Columbia University, Center for Risk Communication  
 Harvard University, Harvard School of Public Health  
 Rutgers University, Environmental Communication Research Program  
 Texas A & M University, Hazard Reduction and Recovery Center

University of Colorado, Natural Hazards Research and Applications Information Center  
 University of Delaware, Disaster Research Center  
 University of Louisville, Center for Hazard Research and Policy Development  
 University of North Carolina, Institute for Environmental Studies  
 University of Pennsylvania, The Wharton School, Risk and Decision Processes Center  
 University of Southern California, Institute of Safety and Systems Management  
 University of Tennessee, Energy, Environment, and Resources Center  
 University of Virginia, Center for Risk Management of Engineering Systems  
 University of Waterloo, Institute for Risk Research

Should your center be on this list? If so, please write or call Srinivas Emani, Graduate School of Geography, Clark University, 950 Main Street, Worcester, Massachusetts 01610 (Phone 508-793-7525); or Jeanne X. Kasperson, Research Librarian, CENTED, Clark University [same address], (Phone 508-751-4623).

Emani and Kasperson will also make followup calls to the small cadre of SRA members who responded to the previous calls. The directory should be available for distribution at the 1991 SRA Annual Meeting.

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## RAGS: Risk Assessment Guidance for Superfund

*The following abstracts, which were inadvertently omitted from the 1990 Annual Meeting abstract supplement, are reprinted here as a courtesy to the authors and to those attendees wishing to keep a record of the 1990 Annual Meeting.*

**RAGS: OVERVIEW AND PROCESS.** *J. P. Laurenson, C. S. Cheney, and B. L. Jones; ICF Incorporated.*

In 1986, EPA established a process and developed a guidance document, with technical assistance from ICF, for assessing human health risks at Superfund sites during the remedial investigation and feasibility study (RI/FS). This original process and guidance recently were, or are in the process of being, updated based on the new NCP, new policy and technical advances, and experience conducting risk assessments at sites. The new guidance, Risk Assessment Guidance for Superfund (RAGS), has been published in two volumes: Volume 1, Human Health Evaluation Manual (HHEM) and Volume 2, Environmental Evaluation Manual (EEM). HHEM is composed of Part A, Baseline Risk Assessment, Part B, Development of Preliminary Remediation Goals, and Part C, Risk Evaluation of Remedial Alternatives. Of these three parts, only Part A has been published. Under the revised guidance, the baseline risk assessment process involves more integration of the information requirements into the scoping and site characterization steps. Less emphasis is placed on developing a list of "indicator chemicals," and more guidance is provided

on data evaluation. The revised exposure assessment guidance describes the NCP's new reasonable maximum exposure (RME) concept, as well as new default intake equations. The toxicity assessment guidance is expanded, and the use of evolving toxicity data bases is encouraged. The risk characterization guidance describes in more detail than previously how risk assessment results can be presented. A new chapter has been added on how to document, review, and manage the risk assessment, and another new chapter has been added that provides guidance on radionuclides. Parts B and C of HHEM will include guidance on how to use the baseline risk assessment to establish preliminary remediation goals and to evaluate the relative effectiveness (in terms of risk) of remedial alternatives.

**RAGS: A SIMPLE CASE STUDY.** *C. S. Cheney and J. P. Laurenson; ICF Incorporated.*

A simple case study illustrates many of the issues associated with conducting a Superfund risk assessment. The specific issues addressed in the case study include planning for a risk assessment, evaluating data, obtaining the toxicity information, assessing exposure (including selecting reasonable future land-use scenarios and calculating reasonable maximum exposure), characterizing risk, developing remediation goals, and evaluating the effectiveness of remedial alternatives. Risk management issues also are addressed.

## News from SRA-Japan

Since the last newsletter, 20 new members have joined SRA-Japan, for a December membership count of 260. Also, the date and location of the 4th Annual Meeting and Special Workshop on "Energy Problems and Risks" have been set for June 29, 1991, from 12:30 to 5:00 p.m. at Yamagami Kaikan, University of Tokyo. Guest speakers will be Y. Kaya of the University of Tokyo, addressing the topic "Risks in Energy Problems," and K. Sato of the Japan Nuclear Research Institute, speaking on "Recent Trends on PSA in Nuclear Power." A panel discussion is also being planned.

The 3rd Annual Conference of SRA-Japan was held on November 30 and December 1, 1990 at the Institute of

Public Health in Tokyo. About 100 participants attended the five sessions in which 17 papers were presented. The session topics and chairs were: "Risk Estimation and Evaluation Models," T. Kusama, University of Tokyo Medical School; "Risk Cost-Benefit," Y. Sakai, University of Tsukuba; "Ex Ante Risk Management," U. Kitabatake, University of Tsukuba; "Risk Assessment and Science," Y. Hayashi, National Institute Hygienic Science; and "Product Liability and Risk Spreading," Y. Asami, Fukuoka University. The program also included a lecture on the "International Trend in Chemical Risk Management" by guest speaker T. Oshima of the Japan Chemical Industry Ecology-Toxicology and Information Center.

Abstracts of the 3rd Annual Conference are available upon request, and the proceedings (about 60 pages) are available in Japanese for 2000 yen per copy. Copies of the SRA-Japan journal, Volume 2, Number 1, which was published in September, are also available for \$20 per copy. To request these publications, please contact Saburo Ikeda, Institute of Socio-Economic Planning, The University of Tsukuba, 1-1-1 Tennoudai, Ibaraki 305, Japan (Phone 0298-53-5182; FAX 0298-53-5070).

**Fourth Annual Meeting  
SRA-Japan  
June 29, 1991  
University of Tokyo**

## Japanese-USA Environmental Research Proposed

While in attendance at the 1990 SRA Annual Meeting, Takashi Miura of Japan's National Institute for Environmental Studies invited U.S. researchers to propose research programs that could be carried out during short-term assignments (less than 1 year) to Japan. Miura, principal researcher in the Environmental Risk Assessment Program of the Institute's Regional Environment Division, listed five research areas of interest: (1) urban environmental health (considering urban stresses such as noise); (2) chemical exposures and health effects; (3) chemical ecological hazards; (4) biotechnology assessments; and (5) air pollution.

Miura and another annual meeting attendee from Japan, Hiroaki Shiraishi, whose research is in chemical exposures, say Japan is eager to benefit from the American experience in environmental studies, pointing out that last year several representatives from the U.S. Environmental Protection Agency spent four weeks in Japan. Proposals received will be submitted to the Japan Environment Agency for support in initiating a cooperative program.

Proposals should be mailed to: Dr. Takashi Miura, Principal Researcher, Environmental Risk Assessment,

Regional Environment Division, National Institute for Environmental Studies, Onogawa 16-2, Tsukuba, Ibaraki, 305 Japan (Fax 0298-51-4732).



*Takashi Miura and Hiroaki Shiraishi, National Institute for Environmental Studies, Japan, at 1990 SRA Meeting.*

## News from SRA-Europe

Pieter Jan Stallen, president of SRA-Europe, reports that about 80 persons from Eastern European countries joined the Society's European Section at the November 1990 conference, "Environmental Risk Management: the European Case," held in Kiev, USSR. Coorganized by SRA-Europe (with the Committee for Systems Analysis of the USSR Academy of Sciences) and sponsored by several organizations, the conference attracted 120 conferees, approximately 90 from Eastern Europe and 30 from the West.

Stallen was SRA-Europe's representative at the conference and penned the resolution and recommendations, which were adopted almost unanimously. The resolution focused on the fact that the "European environment is at risk" due to "decades of emissions of toxic substances into the air, water, and soil" that "are posing threats of an unprecedented nature to the ecosystems, of which man is a part." No single entity is blamed for the late recognition of these hazards in Eastern and Western Europe; however, with the "radical socio-political changes now occurring in Europe," the conferees urged that "this is the time to make this concern play its vital role at all stages of construction of the common European house. Every citizen has the right to a safe and healthy environment." The cooperation of all organizations who would be part of cleaning up the pollution was cited as a need. Also, "joint efforts are needed to develop and implement risk management policies in order to reach a high level of protection that allows justifiable allocations of private or public resources within the context of international standards or codes of conduct."

The recommendations which were made include the following: (1) to base decisions to invest in any industrial, transportation, or energy generating systems—or to clean up existing hazards—on environmental impact and health assessment, risk assessment and risk management, taking



*P. J. Stallen, president of SRA-Europe and one of three recipients of SRA's 1990 Outstanding Service Award.*

into account the full environmental and commercial life cycles; (2) to develop environmental health impact assessment methodologies based on the European Charter on Environment and Health; (3) to facilitate communication between environmental risk professionals; (4) to establish procedures in environmental impact assessment, risk assessment, and environmental auditing in Central and Eastern Europe (including on-site training); (5) to establish means of communicating environmental impact assessment and policy making with the public, taking into account social concerns, (6) to urge governmental support of the UNEP/International Register of Potentially Toxic Chemicals' attempt to establish an information exchange on hazardous chemicals in Central and Eastern Europe; (7) to encourage industry and government from all European nations to enter into exchange programs for the purpose of training a wide range of professionals; (8) to establish separate chapters of SRA-Europe and encourage membership from the professional fields of health and environmental sciences, engineering and statistical sciences, and social and policy sciences; and (9) to make an ecological plan for Europe with the cooperation of all European countries.

SRA-Europe has a new address: SRA-Europe Secretariat, Tooropstraat 34, 6813 KT Arnhem, The Netherlands. [The telephone and FAX numbers were not available when this newsletter was published.]

## SRA, Philippines Organized

The Society for Risk Analysis, Philippines (SRA, Philippines) was recently incorporated to address issues and concerns on risk and environmental assessment and management (REAM) in the Philippines. It will serve as the local affiliate of the international society based in the United States.

SRA, Philippines aims to advance the level of knowledge, understanding, and proper application of REAM approaches, methods, and techniques; encourage communications and collaborative work among those engaged in REAM in the Philippines; and promote interaction

among researchers, practitioners, and users of REAM. Meetings of SRA, Philippines are being held monthly. A brochure has been created for use in recruiting new members, and the first issue (November-December, 1990) of a bimonthly newsletter entitled *Risk Watch* has been published.

The founding president of SRA, Philippines is Corazon PB. Claudio, who is president of SITECH Resources Group, Inc. and of the Technology, Risk, and Development Foundation, Inc. She is also the program director of the Technology and Risk Assessment and Management Program

*(Continued on page 16.)*

## SRA, Philippines

(Continued from page 15.)

in the Department of Industrial Engineering and Operations Research, College of Engineering, University of the Philippines. The SRA Founding Board of Incorporators include the following:

—*Ramon P. Abracosa*, College of Engineering and Agro-Industrial Technology at the University of the Philippines Los Banos and the Technology, Risk, and Development Foundation, Inc.

—*Armando A. Andaya*, Department of Biology at De La Salle University.

—*Roger T. Arambulo*, Aramex Pacific Inc., the Valle Verde I Association, and the Federation of Valle Verde Associations, Inc.

—*Mario C. Berbano*, Environmental Management Department of Philippine National Oil Company and the College of Engineering at University of the Philippines.

—*Rolando C. Cabrera*, Risk Management Department of San Miguel Corporation and president of the Society of Risk and Insurance Management.

—*Antonio MA. M. Ingco*, Risk Management Department of National Power Corporation.

—*Reynaldo M. Lasaca, Sr.*, Risk Protection Technologies and Insurance Services, Inc.

—*Remedios A. Savellano*, Marketing and Consultancy Services Division of the Department of Science and Technology at Technology Application and Promotion Institute.

The Executive Secretary of SRA, Philippines is Ana Esperanza C. Ong, program officer of the Technology, Risk, and Development Foundation, Inc.

Inquiries about SRA, Philippines should be addressed to Corazon PB. Claudio; P.O. Box 12228, Ortigas Center Post Office 1600, Pasig, Metro Manila, Philippines (Phone 631-3138 or -5714; FAX 632-631-5714).

## New Exposure Analysis Society Proposes Cooperative Programs

A group of scientists and engineers who have become increasingly concerned about fundamental principles that provide the basis for exposure assessments organized the International Society of Exposure Analysis (ISEA) in 1990. Stating that their purpose is "to foster scientific excellence in the research and the analysis of human exposure within the community and occupational environments, which includes the pathways of indoor and outdoor air, water, soil and foods, and to provide opportunities for multidisciplinary interactions on dose-effects relationships," the ISEA is launching a new journal, *Exposure Analysis and Environmental Epidemiology*, which will publish its first issue in January 1991.

ISEA's major activity in 1991 will be its first Annual International Conference, which will be held in Atlanta, Georgia November 18-21. The Society hopes to attract professionals conducting research or participating in field or modeling applications for single or multiple routes and media of exposure. Abstract submissions should be mailed to the technical program chairman, Gerald Ackland, EPA AREAL, MD-75, Research Triangle Park, North Carolina 27711.

Conversations between SRA President Curtis Travis and ISEA Treasurer Paul J. Lioy of the University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School (UMDNJ-RWJMS), have explored the possibility of cooperative efforts of the two societies. One proposal is the exchange of information in the societies' publications. Another is a joint workshop on the definitions used in exposure assessment. The goal is to achieve a consensus on terminology, and thereby reduce the number of dialects and promote better communication. Lioy says the U.S. EPA is very interested in supporting such an event, and the soon-to-be-published EPA exposure assessment guidelines and the recent National Research Council Biological Markers and Air Pollution Exposure Assessment Reports, supported by the Agency Toxic Substance Disease Registry, provide strong starting points. Those interested in helping to develop such a program should call Paul J. Lioy at 201-463-4547.

## Call for Nominations for SRA Awards

The SRA Awards Committee invites nominations for the two categories of awards presented by the Society. One category is the **Distinguished Contribution Award**, which honors an individual (who need not be a member of the Society) whose work has significantly advanced the scientific foundations or the applications of risk analysis. The other category is the **Outstanding Service Award**, which is presented to SRA members who have performed meritorious services on behalf of the Society.

Please submit the names of your nominees and a brief paragraph supporting each by March 1, 1991, to:

Vincent T. Covello  
Center for Risk Communication  
Columbia University  
School of Public Health  
60 Haven Avenue  
New York, New York 10032  
FAX: 212-749-3590



## Nominating Committee at Work

The chair of the 1990-91 Nominating Committee, Richard C. Schwing, reported in October that four SRA members had agreed to serve on the Nominating Committee: Halina Szejnwald Brown of CENED at Clark University; Daniel M. Byrd III, who is a consulting toxicologist in Falls Church, Virginia; Paul F. Deisler, Jr., 1986-87 SRA president, Houston, Texas; and Frances M. Lynn of the Institute for Environmental Studies at the University of North Carolina at Chapel Hill.

The task of the committee is to develop a slate of officers which will provide a variety of views on the total Council from various disciplines, organizations, geographic locations, etc. Candidates also should be known for their diligence in fulfilling commitments, have shown interest in the Society through their work for it, and have been generally active contributors to the field of risk analysis and related fields.

The membership of SRA is invited to send their nominations for the 1991-92 slate of officers to the Nominations Committee chair. (See accompanying box; February 25 deadline is firm.)

## Calendar of Events

February 21-March 14 (four Thursdays). RISK ASSESSMENT COURSE, Techmart, Santa Clara, California. This course (number EDP 903207) is part of the curriculum leading to a Professional Certificate in Hazardous Materials Management offered by the University of California Extension, Santa Cruz. Main focus on estimation of cancer risk from exposure to chemicals. For more information, call the University (Phone 408-562-5711).

February 24-March 1. 21st CONFERENCE ON ENVIRONMENTAL AND ENERGY ENGINEERING IN THE FOOD PROCESSING INDUSTRY, Sheraton Hotel and Spa, Santa Barbara, California. Sponsored by the Engineering Foundation and chaired by James L. Ross, Black & Veatch and George O. Wornson, Miller Brewing Company. For more information, please contact: Engineering Foundation, 345 East 47th Street, New York, New York 10017 (Phone 212-705-7835; FAX 212-705-7441).

February 25-March 1. SOCIETY OF TOXICOLOGY (SOT) ANNUAL MEETING, Loews Anatole Hotel, Dallas, Texas. [Risk-related happenings are highlighted.] Special session on February 24, 5:00 p.m., on "Chemicals and Acceptable Risk, the Public and the Press." A continuing education course, "Risk Communication: Problems, Perceptions and Practice," on February 25. Several symposia on risk-related topics. For more information, contact Society of Toxicology, 1101 14th Street NW, Suite 1100, Washington, DC 20005 (Phone 202-371-1393; FAX 202-371-1090; Telex 292046 IMGUR).

March 26-28 and April 3-4. HARVARD EDUCATIONAL RESOURCE CENTER HAZARDOUS SUBSTANCE TRAINING PROGRAM, Harvard School of Public Health, Boston, Massachusetts. Courses covering certain aspects of risk include "Assessment and Control of Occupational Hazards in Waste Site Remediation and Hazardous Waste Disposal" (March 26-28) and "Hazardous Substance Risk Communication and the News Media" (April 3-4). For more information, please contact Daryl Bichel, Director of Continuing Education, Harvard Educational Resource Center, 665 Huntington Avenue, Boston, Massachusetts 02115 (Phone 617-432-3314).

## Call for Nominations for SRA Officers

The SRA Nominating Committee solicits nominations for the following offices in the Society's 1991 elections:

President-Elect  
Secretary  
Treasurer  
Three Councilors

Both the secretary and treasurer will serve two-year terms and may succeed themselves one time; councilors will serve three-year terms and may not succeed themselves until one year has elapsed following the completion of their terms.

Please submit your nominations with a brief paragraph supporting each by February 25, 1991, to:

Richard C. Schwing  
Chairman, SRA Nominating Committee  
Operating Sciences  
General Motors Research Laboratories  
30500 Mound Road  
Warren, Michigan 48090-9055  
[Phone 313-986-1348; FAX 313-986-0574].

April 1-5 and 22-26. SAFETY ANALYSIS AND RISK ASSESSMENT FOR CHEMICAL PROCESS INDUSTRY PRACTITIONERS, Stouffers Presidente Hotel, Houston, Texas. Organized by the American Institute of Chemical Engineers (AIChE) in association with the Center for Chemical Process Safety (CCPS) of AIChE and JBF Associates, Inc., Knoxville, Tennessee, to teach engineers and scientists how to perform safety analyses and risk assessments of CPI processes. Course 1 (April 1-5): *Hazards Evaluation and Reliability Analysis of CPI Systems*; Course 2 (April 22-26): *Consequence Assessment and Mitigation*. Course fees: \$1295 for AIChE members, \$1395 for non-members; for both courses: \$2495 for AIChE members, \$2595 for non-members. For registration forms, call registrar at AIChE (Phone 212-705-7526).

June 4-7. NINTH ANNUAL SUMMER INSTITUTE IN RISK MANAGEMENT IN ENVIRONMENTAL HEALTH AND PROTECTION (including Quantitative Risk Assessment), New York University, Robert F. Wagner Graduate School of Public Service, New York City. Institute director: Rae Zimmerman, Professor of Planning at Robert F. Wagner Graduate School of Public Service (Phone 212-998-7432, 7400). Intensive course on risk management and quantitative risk assessment for chemical risks (sudden releases, hazardous waste disposal, water supply contamination). Quantitative risk assessment procedures, including fate and transport of contaminants, toxicology and epidemiology of environmental health protection, risk perception and risk communication techniques for public acceptance. Designed for health, safety, and environmental professionals in industry and government. Bachelor's degree or equivalent required. Offered for graduate credit (\$1396) or non-credit certificate (\$895). Contact Debra Frank, Summer Institute in Risk Management in Environmental Health and Protection, Robert F. Wagner Graduate School of Public Service, New York University, 4 Washington Square North, NY, NY 10003 (Phone 212-998-7518).

## SRA Chapters Begin New Year

For the second year, Council member Catherine St. Hilaire hosted a breakfast meeting for chapter representatives attending the 1990 Annual Meeting. Gathering at 7 AM Wednesday morning, October 10, the group again discussed how the national organization could help the individual chapters, the most common request being a printout of national members living in their respective areas. Seven chapters were represented at the meeting as follows: Philadelphia (Branden Johnson), Ohio (Bert Haakinen), Southern California (John Garrick), National Capital Area (Larisa Rudenko), East Tennessee (Mary English), Metropolitan (Rae Zimmerman), and Greater Pittsburgh (Jeanette Trauth).

With the addition of the Rocky Mountain Chapter, the Society for Risk Analysis now has a total of 13 chapters. The following reports have been received by RISK newsletter from eight of the chapters.

### Southern California Chapter

Larry R. Froebe, councilor of the Southern California Chapter and editor of its newsletter, *Risk Resources*, reports that preparations for hosting the Probabilistic Safety Assessment and Management International Conference (PSAM) on February 3-7 in Beverly Hills, California have dominated the activities of the chapter. The conference, sponsored by SRA and chaired by former SRA councilor George Apostolakis, will provide an international forum for information and technology exchange between risk professionals.

Chapter president Michael Stamatelatos says every risk and reliability professional should attend the PSAM conference: "We live in a world economy. Risk-based environmental regulations and process safety are becoming common in the United States. Similar risk-based regulations will be part of the success of the European Economic Community...We can and must benefit from the experiences of our colleagues worldwide." (*Risk Resources*, December 1990).

PSAM has accepted for presentation over 300 papers, which will be distributed at the conference to full registrants in a two-volume set of proceedings. There will also be a short course on Probabilistic Risk Assessment for reliability, safety, and health risk assessment on February 3 and a software and publisher exhibit of state-of-the-art reliability, safety, and environmental health risk assessment tools.

The chapter's December meeting included dinner and a speech by Louis Levy, staff toxicologist of the California Department of Health Services. He spoke on "Health Risk Assessment—What, How and Why?"

### Rocky Mountain Chapter Approved

The SRA Council's approval of the 13th chapter of the Society was announced by John Garrick during the Society's Business Meeting in New Orleans.

The Rocky Mountain Chapter got its start when a steering committee began meeting in May 1990. An organizational meeting was held in July to approve bylaws and elect officers, and on September 11 almost 50 people gathered for a chapter kickoff meeting at the Embassy Suites Hotel in Denver. SRA President John Garrick spoke to the group about the national society, and James Scherer, Regional Administrator of the U.S. Environmental Protection Agency (EPA), told how the EPA uses risk assessments in the context of policy making. The second chapter meeting was held in November at the Rocky Mountain Arsenal, a Superfund site, with representatives from the Army and EPA discussing their relationship in Superfund site cleanup.

The president of the chapter is Tom Laetz, U.S. General Accounting Office, Denver, who says their membership has grown from 5 to 40 in four months and is composed of a diverse group of individuals representing aca-

demic, government, and private organizations. Although the central topic of interest seems to be risk communication (with member interests including natural hazards assessment, hazardous waste management, mineral economics, and environmental toxicology), the chapter has not focused on any particular topic and encourages anyone who is interested in risk-related subjects to join the group. Chapter meetings will be held every two months, with various organizations hosting many of the meetings. Several firms have already agreed to sponsor chapter meetings centering around specific experiences that their staffs have had while working on various risk assessment and management issues. The location of meetings may vary, with consideration being given to meeting occasionally in other communities outside of Denver.

Other chapter officers are: President-elect, Ralph Grover, Wastren, Inc.; secretary, Robert Melvin, Department of Economics, University of Denver; treasurer, Robert Benson, U. S. Environmental Protection Agency, Region VIII; councilor, Tony Cox, Cox Associates; and councilor, Dennis Smith, EG&G Rocky Flats, Inc.

### Ohio Chapter

Steve Lutkenhoff, councilor and past president of the Ohio Chapter, reports that over 150 persons attended the chapter's RISKWARE '90, an all-day seminar and exhibition of computer software and data bases related to risk analysis that was held on December 7 in Columbus.

The morning session included talks by Joseph Fiksel, Cimflex Teknowledge Corporation, on examples of computer-aided risk analysis in the 90s, current development, uses, and future needs, and Philip Wexler, National Library of Medicine, who presented a review of issues pertaining to information technology for the 90s.

The afternoon session was dedicated to software application and demonstration with hands-on trial as desired. There were 24 exhibitors representing 60 different products and applications. A 60-page software/program synopsis was compiled with technical data and information describing each software program's requirements, availability, costs, application, and utility, and was distributed to each attendee. A limited number of

these are available, for a nominal fee to cover reproduction and mailing costs, by contacting Ron Marnicio, Ebasco Environmental, 5000 Bradenton Avenue, Suite 200, Dublin, Ohio 43017-2546.

The Ohio Chapter has elected officers for 1991. Joining the new president, Ron Marnicio of Ebasco Environmental, is president-elect Bert Haakinen of Proctor and Gamble, treasurer Jacqueline Patterson of the U.S. Environmental Protection Agency (U.S. EPA), and councilors Virginia Forrest of the Naval Medical Research Institute, Rick Hertzberg of U.S. EPA, and past president Steve Lutkenhoff of U.S. EPA.

### Philadelphia Chapter

The new president of the Philadelphia Chapter, Branden B. Johnson of the New Jersey Department of Environmental Protection, reports that he has been meeting with former members of the chapter's executive committee, Rebecca Coles and Carolyn Nunley of Environmental Research Management, Inc., and Eileen Mahoney of Mahoney Associates, to organize the chapter for 1991-

92. A dinner meeting was being planned for January 15 on "The Future of Superfund Risk Assessments" with speakers representing the U.S. EPA, state, and industry viewpoints. One focus of the discussion will be the impact of the EPA directive barring Potentially Responsible Parties from conducting Superfund risk assessments. Future meetings are being planned for March and May, as well as a drive for new members. Inquiries concerning the chapter may be addressed to **Branden B. Johnson**, Risk Communication Unit, Division of Science and Research, New Jersey Department of Environmental Protection, CN 409, Trenton, New Jersey 08625 (Phone 609-633-2324).

### National Capital Area Chapter

**Stephen Brown**, past president of the National Capital Area Chapter, reports that the chapter's fall series of seminars, all at the U.S. EPA's Education Center Auditorium, consisted of three presentations on cancer risk assessment.

In October **Doreen Hill**, an environmental health scientist in the EPA's Analysis and Support Division of the Office of Radiation Programs, spoke on the EPA's effort to evaluate the scientific data on the potential risks from exposure to electromagnetic fields (EMFs) in the environment, the home, and at work.

In November, **Richard Belzer**, a staff economist in the Office of Information and Regulatory Affairs at the Office of Management and Budget (OMB), discussed how the 1990 version of the OMB's "The Regulatory Program of the U.S. Government" came to include a "significant" section on the issue of policy makers who have favored "conservative" assumptions that tend to overestimate instead of underestimate risk.

In December, SRA councilor **Peter Barton Hutt** of the Washington, D.C. law firm of Covington and Burling, which specializes in food and drug law and government regulation of health and safety, discussed "Risk Assessment and the FDA: History and Prospects; or 'De minimis or not de minimis: Is that the question?'" Tracing the 20-year history of the U.S. Food and Drug Administration's use of cancer risk assessment for regulating chemicals and offering ideas about the contribution of risk assessment in the future, Hutt's presentation was illustrated by examples from his legal casebook *Food and Drug Law: Cases and Materials*, coauthored with Professor **Richard A. Merrill**.

For more information on the chapter meetings, please contact the chapter president: **Curtis J. Haymore**, ENVIRONOMICS, 502 Glyndon Street, S.E., Vienna, Virginia 22180 (Phone 503-242-0265).

### Research Triangle Chapter

**Harvey Richmond**, editor of the Research Triangle Chapter's *Risk Notes* and

chair of the Workshop Committee, reports the Third Annual Workshop (October 1990) was successful not only in providing a state-of-the-art discussion of noncancer risk assessment methods and issues but also in adding 40 new members to the chapter and raising funds for future workshops and chapter activities. There were 92 participants at the day-long session, which was co-sponsored by the Chemical Industry Institute of Toxicology, the EPA Office of Air Quality Planning and Standards, the Health Effects Research Laboratory, and the Environmental Criteria and Assessment Office. Ideas and volunteers for the next workshop are being solicited by **Josephine Mauskopf**, the chapter's president-elect (Phone 919-541-6468).

The November 1990 dinner meeting featured **Richard Andrews**, director of the University of North Carolina Institute for Environmental Studies, who spoke on the recent report, "Reducing Risk," prepared by the Relative Risk Reduction Strategies Committee of the EPA's Science Advisory Board. Andrews served on the Strategy Options Subcommittee for the report, which is available without charge from the EPA, Science Advisory Board, 401 M Street, S.W., Washington, D.C. 20460.

The January 1991 meeting scheduled two speakers: **Larry Cupitt**, EPA, who spoke on "Clean Air Act Amendments and How They Came About," and **Tim Mohin**, EPA, who presented "Overview of Air Toxics Provisions, and Federal Perspectives on the Clean Air Act Amendments."

The next meeting will be on February 19, with **Douglas Crawford-Brown** from the University of North Carolina's Department of Environmental Sciences and Engineering speaking on "Philosophical Foundations of Risk Analysis: The Inseparability of Logic, Epistemology, and Ethics."

In August 1990 about 20 scientific and engineering societies with chapters or sections in the Research Triangle area of North Carolina formed an organization called the **Triangle Council of Engineering and Science Societies (TCESS)**. The group intends to serve as coordinator of scientific and engineering issues (with an emphasis on education), including sponsorship of local activities as part of National Engineers Week; to put out a monthly newsletter with a calendar of events which are hosted by its member organizations; and to publish a directory of member organizations' officers. Research Triangle Chapter has joined TCESS.

The new officers of Research Triangle Chapter are **Deborah Amaral**, president; **Josephine Mauskopf**, president-elect; **Robert Hetes**, secretary; **David J. McKee**, treasurer; and **Allan H. Marcus**, **Thomas B. Starr**, and **Annie Jarabek**, councilors. Please contact **Deborah Amaral** with questions about the Chapter: 105 Rosenau CB#7400, University of North Carolina, Chapel Hill, North Carolina 27599-7400 (Phone 919-966-6691).

### Northern California Chapter

**Thomas E. McKone**, secretary of the Northern California Chapter and editor of its monthly newsletter, reports that the chapter began its fifth year by announcing its new slate of officers at an October 17, 1990, dinner meeting at the Stanford University Faculty Club. **Allan Smith**, professor of epidemiology of the University of California School of Public Health, is the president for 1991; **Robert Scofield** of Environ Corporation in Emeryville is the treasurer for 1991-93; and **Lauren Zeise** of the State of California Department of Health Services in Berkeley is a councilor, also for a two-year term.

The speaker for the evening was **Wayne Ott**, a visiting faculty member in Engineering at Stanford University from the Office of Research and Development at the EPA in Washington, D.C., who spoke on how data from total human exposure studies can assist in environmental decision making, particularly with regard to identifying the critical sources of pollution which should be targeted for risk management. [Further information on the subject may be obtained from Ott, W.R., "Total Human Exposure: Basic Concepts, EPA Field Studies, and Future Research Needs," *J. Air and Waste Management Assoc.* 40 (7), 966-975 (July 1990).]

Beginning January 30, the chapter will cosponsor a biweekly seminar at the University of California, Berkeley, on "Cancer Risk Assessment: Principles and Methods," taught by the chapter president. (For further information, call 415-643-5378.)

Early this year the chapter plans to encourage the renewal of inactive memberships and to solicit new members by mailing membership forms to approximately 200 persons. As in the past, the chapter will cosponsor the annual conference coordinated by the local chapter of the Society of Toxicology and held in the spring of 1991.

### Columbia Cascades Chapter

**Richard N. Palmer** of the Department of Civil Engineering at the University of Washington is the new president of the Columbia Cascades Chapter. The chapter held an afternoon meeting on January 18, 1991, on the campus of the University of Washington. The agenda began with a presentation by **Wayne Landis** of the Institute for Environmental Toxicology and Chemistry in the Huxley College of Environmental Studies at Western Washington University. Landis spoke on "Risk Assessment of Genetically Engineered Organisms: Factors in the Assessment of Degenerative Plasmids." A business meeting was held to discuss future meetings, ways to expand the membership, and the development of new committees.

For more information about the chapter, please contact **Richard Palmer**, Department of Civil Engineering, FX-10, University of Washington, Seattle, Washington 98195.

## NSF Funding

(Continued from page 4.)

in their fields for their methodological expertise. An advisory panel, which generally meets twice a year, makes further recommendation on the proposals. Based on this information, decisions are made on which proposals are to be accepted. The awards are then made to the institutions. The basic criteria used to determine the acceptability of a proposal include the competence of the researcher, the intrinsic merit of the research (that is, the novelty and scientific quality), the utility or relevance of the research, and the effect of the research on science in general. The research should have relevance in an operational context, be grounded in theory, be based on empirical observation or be subject to empirical validation, and be generalizable.

There are also two special initiatives under which NSF is awarding grants. One, the joint NSF/Private Sector Research Opportunities Initiative requires that a research proposal be submitted with a corporate sponsor who will provide matching funds. The second initiative is the Human Dimensions of Global Environmental Change Competition, which has a \$2 million budget. Bordley strongly encouraged proposals for global warming projects because very few have been submitted.

Target dates for proposal submissions are January 15 and August 15. For more information, please contact one of the two program directors, Robert F. Bordley (Phone 202-357-7417; Bitnet: rbordley@NSF) or L. Robin Keller (Phone 202-357-7569; Bitnet: lkeller@nsf) at National Science Foundation, Room 336, 1800 G Street N.W., Washington, D.C. 20550 (FAX 202-357-0357).

**NOTICE:** The SRA Council will meet in Washington, DC, in March. Committee chairs and other SRA members having topics they wish to be discussed by Council should reach their contact councilors or write to the Secretariat at the address shown on the back page of this newsletter.

## EPA Funds Risk Communication Research

The Cooperative Agreements in the Risk Communication Program funded by the U.S. Environmental Protection Agency (EPA) provide financial assistance for research projects in risk communication. Project managers apply for the funds, which are awarded to their institutions specifically for the approved projects.

EPA's Cooperative Agreements differ from grants in two ways: (1) the institution must provide some share of the resources (usually at least 5%); and (2) EPA will be involved in the research and will collaborate with the principle researcher in making decisions concerning the project.

The first request for proposals (RFP) was issued in the fall of 1987. Owing to the uncertainty of the U.S. federal budget for 1990-91, the next RFP may not be issued until the fall of 1991.

The Cooperative Agreements that were funded for fiscal year 1990 are listed below (with the researchers' disciplines in parentheses):

"Community Interpretation of Hazardous Materials Risk Information," Virginia Polytechnic Institute: David Conn, William Owens, Richard Rich (economics, law, political science, and sociology) (continued from the previous year).

"Increasing Awareness of Waste Disposal Methods Among Junior High School Students Using Self-producing Video Pro-

grams," University of Hartford: Rodney Carveth, Roger Desmond (communication).

"Risk Communication, Recycling, and Young People," University of Oklahoma/University of California-Riverside: David Holtgrave, Barbara Tinsley (quantitative psychology, educational psychology).

"Press Coverage of Risks from Environmental Contaminants," Marquette University/University of Wisconsin: Robert Griffin, Sharon Dunwoody (mass communication).

"Perceptions of Chemical Risks Among Young People," Columbia University: Vincent Covello, Elaine Arkin, David McCallum (social psychology and quantitative sociology, economics, biomedical engineering).

"Industry Response to SARA Title III Relating to Pollution Prevention, Risk Reduction, and Risk Communication," Columbia University: Susan Santos, Vincent Covello (civil engineering and public health, social psychology and quantitative sociology).

Results from some of these and earlier research programs funded by the Cooperative Agreements were presented in the Risk Communication Roundtable sessions at the 1990 SRA Annual Meeting. For more information about the research program in risk communication and other EPA risk communication activities, call Ernestine Thomas on the Risk Communication Hotline (Phone 202-382-5606).

[Note: SRA Councilor Ann Fisher, now at The Pennsylvania State University, is the former manager of the EPA Risk Communication Program.]

## Comings & Goings

(Continued from page 11.)

Applications International (SAI) division, which offers expertise in atmospheric sciences and air quality management. Roberson is a registered professional engineer with 19 years of experience and is nationally respected for his environmental work related to characterizing emissions from combustion sources, particularly electric power plants.

Yates & Auberle, Ltd. has relocated its Oak Brook office to Oakbrook Terrace Tower, Suite 1300, One Tower Lane, Oakbrook Terrace, Illinois 60180 (Phone 708-571-2162; FAX 708-571-0439).

Suresh H. Moolgavkar, a researcher renowned for his two stage model of

carcinogenesis, has signed a consulting agreement with Clement International Corporation and will be coordinating his work with Kenny S. Crump, director of Clement's K. S. Crump Division. Moolgavkar is a member of the Fred Hutchison Cancer Research Center in Seattle, Washington and a professor in the department of epidemiology at the University of Washington.

Sheri Tickle Hester, the technical program chair for the 1990 SRA Annual Meeting, is leaving the Office of Risk Analysis in the Health and Safety Research Division of the Oak Ridge National Laboratory for a position as information specialist with Integrated Laboratory Systems. Her new address is P.O. Box 5713, Oak Ridge, Tennessee 37831.

# CALL FOR PAPERS

## 1991 ANNUAL MEETING OF THE SOCIETY FOR RISK ANALYSIS

Hyatt Regency Hotel, Baltimore, Maryland  
December 8-11, 1991

**THEME: Risk Analysis in Support of Public and Private  
Sector Decision Making**

**PROGRAM CATEGORIES:**

Engineering and Statistics  
Health and Environment  
Social and Policy Issues

**TOPICAL ISSUES:**

Implications of the New Clean Air Act  
Nuclear Waste  
Global Climate Change  
Ecological Risk Assessment  
Risk Analysis for Engineered Systems  
Waste Minimization/Pollution Prevention  
Innovations in Health Risk Assessment  
Pharmacokinetic and Pharmacodynamic Modeling  
Risk Perception  
Risk Communication  
Risk Analysis for State and Local Governments  
Safety at Chemical Plants  
Effectiveness of Remedial Alternatives  
Improving Risk Characterization  
Innovative Methods in Toxicology  
Decision Making Under Uncertainty  
Decision Making and Ethics  
Community Involvement  
Waste Management Strategies  
Siting of Hazardous Facilities  
Medical Decision Making

Abstract forms and instructions will be mailed to every SRA member in February. If you need extra forms or would like to pass material on to colleagues who are not members, contact the SRA Secretariat at 8000 Westpark Drive, Suite 130, McLean, VA 22102 (Phone: 703-790-1745; FAX: 703-790-9063).

## Positions Available

### Risk Assessment Career Openings

Envirologic Data, a leader in human health and environmental risk assessment and a subsidiary of Groundwater Technology, Inc., has immediate openings for a senior toxicologist and an environmental health scientist at its Portland, Maine office. The successful candidate for senior toxicologist will have a Ph.D. in toxicology or related field, excellent analytical, communication, and management skills, as well as two to three years of experience in toxicology, exposure evaluation, and health risk assessments. Experience in regulatory programs is desirable. Responsibilities will include technical oversight, project management, and business promotion. Occasional travel is required. The successful candidate for environmental health scientist will have a B.S. and two to three years of risk assessment and regulatory program experience and toxicology training or, preferably, an M.S. or M.P.H. with similar experience. Responsibilities will include quantitative risk assessment and business promotional support with opportunities for project management. Occasional travel is required. Qualified candidates should send resumes to:

Human Resources Department  
 Envirologic Data  
 295 Forest Avenue  
 Portland, Maine 04101  
*(An Equal Opportunity Employer)*

### Environmental Toxicologist

An environmental toxicologist is being sought to fill a position in a multidisciplinary environmental technical studies program. The position involves review and interpretation of toxicological information on chemicals of interest to the forest products industry. Familiarity with USA federal (EPA, FDA, CPSC, OSHA) and state regulatory chemical exposure management programs essential. Knowledge of risk assessment procedures necessary. Strong communication skills required. Ph.D. and two to five years experience highly desirable. Send curriculum vitae and salary history to:

Dr. John Pinkerton  
 National Council of the Paper  
 Industry for Air and Stream Improvement  
 260 Madison Avenue  
 New York, New York 10016-2401

### Director of Risk Assessment Services

EBASCO Environmental has an immediate opening for a senior level scientist to direct technical work and manage staff in the area of risk assessment in our Denver office. Position requires an advanced degree (Ph.D. preferred), preferably in the field of toxicology, public health, or environmental chemistry. The successful candidate will have strong quantitative written and oral communication skills. Experience should include performance of EPA and/or other quantitative risk assessments. We offer an excellent salary commensurate with experience as

well as a comprehensive benefit package. Interested persons should submit resumes to:

EBASCO Environmental, Attention: SPO  
 143 Union Boulevard, Suite 1010  
 Lakewood, Colorado 80228-1829  
*(An Equal Opportunity Employer M/F/H/V)*

### Project Manager—Risk Assessment

ECKENFELDER Inc., a leading environmental consulting firm, is currently seeking a risk assessment project manager for its Nashville office. The risk assessment projects are being performed in support of various CERCLA, RCRA, and State-led projects and litigation activities for ECKENFELDER Inc.'s industrial and legal private sector clients. The projects involve the assessment of fate and transport of chemicals in the environment, and the evaluation of potential exposures to human and environmental receptors. An immediate opening exists for an environmental or health scientist (M.S. preferred) with two or more years experience to manage such projects. Experience in consulting work is preferred; regulatory affairs experience is desirable. Candidates must demonstrate their ability to manage complex projects and supervise technical staff; have excellent written and verbal communication skills; be able to interface between clients and regulators; and resolve complex technical and scientific issues. ECKENFELDER Inc. offers competitive salaries and benefits. Send resume and salary history to:

Dr. Linda Meador  
 Director of Human Resources  
 ECKENFELDER Inc.  
 227 French Landing Dr.  
 Nashville, TN 37228  
*(An Equal Opportunity Employer)*

### Risk Assessment Professionals

CH2M Hill, an environmental consulting firm, has openings for Risk Assessment Professionals:

- Los Angeles, CA
- Oak Ridge, TN
- San Francisco, CA
- Denver, CO
- Reston, VA

Positions require M.S. in Environmental Science or related field. Successful candidate will have a minimum of 8 years experience. Requires experience in risk assessment and human health toxicology. Project management and audits desired.

Qualified candidates send resume, including salary history and requirements, in confidence to:

Manager of Recruiting  
 RA22; 191  
 CH2M Hill  
 P.O. Box 221111  
 Denver, CO 80222-9998  
*(An Equal Opportunity Employer)*

## Risk-Related Happenings

### SRA Risk Assessment Course Announced

The Society for Risk Analysis will hold its sixth annual course, "New Directions in Risk Assessment," on May 20-22, 1991 at the Hyatt Regency, Bethesda, Maryland. The intent of the course is to provide an introductory overview of methodologies, assumptions, and new research in risk assessment. Lecturers will show how to perform and interpret risk assessments and how to use them in risk management. Special emphasis will be given to new developments in pharmacokinetics and reproductive, immunological, and neurological risks. Lecturers will be Roy Albert, professor and chairman of the Department of Environmental Health and Kettering Laboratory, University Associates, Inc.; Mildred Christian, president and director of Argus Research Laboratories, Inc.; Vincent Covello, School of Public Health, Columbia University; Bernard Goldstein, professor and chairman of the Department of Environmental and Community Medicine, Robert Wood Johnson Medical School; Loren Koller, dean of the College of Veterinary Medicine, Oregon State University; Lester Lave, Graduate School of Industrial Administration, Carnegie-Mellon University; Paul Liroy, Robert Wood Johnson Medical School; Richard Reitz, associate scientist in toxicology at Chemical Industry Institute of Toxicology; Ellen Silbergeld, Environmental Defense Fund; Curtis Travis, director of the Office of Risk Analysis, Oak Ridge National Laboratory; and, Chris Whipple, Clement International. For further information please call Curtis Travis, course director (Phone 615-576-2107) or Mary Oran, course coordinator (Phone 615-376-9626).

### DoD Risk Assessment Conference Rescheduled

The "Conference on Chemical Risk Assessment in the DoD: Science, Policy, and Practice," planned for October 16-18, 1990, in Dayton, Ohio was rescheduled for April 9-11, 1991. The goals of the conference, sponsored by the Air Force Harry G. Armstrong Aerospace Medical Research Laboratory, the Naval Medical Research Institute Detachment (Toxicology), and the Army Biomedical Research and Development Laboratory, with the cooperation of the National Research Council Committee on Toxicology, are to promote exchange of information between those who develop risk assessment methodologies and those who perform risk assessment. Individuals interested in presenting a poster at the April conference (who had not previously submitted an abstract for the rescheduled October conference) should contact Lois Doncaster, Conference Coordinator, NSI Technology Services Corporation, 101 Woodman Drive, Suite 12, Dayton, Ohio 45431 (Phone 513-258-1150).

### Psychology and Risk Symposium Held

A symposium on "Psychology and Risk" was presented at the 98th Annual Convention of the American Psychological Association on August 14, 1990 in Boston, Massachusetts. Co-sponsored by SRA, the symposium was presented to increase awareness among psychologists of current issues and research in the assessment and communication of environmental, technological, and health risks. Presentations were made by Jeryl L. Mumpower, Center for Policy Research, State University of New York at Albany; Rob Coppock, National Academy of Science, Washington, DC; and James Shanteau, Kansas State

University. The symposium was organized and chaired by George Cvetkovich, Western Institute for Social and Organizational Research, Western Washington University. Cvetkovich is the SRA Society Liaison to the American Psychological Association.

### Lead Inspector Training Program To Be Developed at Tufts University

Tufts University's Center for Environmental Management (CEM) has been chosen by the US Environmental Protection Agency (EPA) to design a national lead inspector training program. The center will receive \$108,500 to develop a program addressing the issues of lead inspection and lead control in paint, soil, and water. The course will be applicable to residential settings, including public and Native American housing for the US Department of Housing and Urban Development (HUD). The grant evolved from a two-day meeting co-sponsored by the EPA and HUD to discuss how national lead training programs could be implemented.

### Clement to Perform Risk Studies

The Sacramento Area Council of Governments has awarded San Rafael-based Systems Applications, Inc., a division of Clement International Corporation, a \$1 million contract to conduct a study of air pollution in Sacramento. The study includes measuring pollutants in the air, developing an inventory of contributing sources, and applying a mathematical computer model to evaluate the best way to improve air quality.

Clement International Corporation also has been awarded an \$80,000 contract to perform a comprehensive human health risk assessment for a proposed waste-to-energy facility which will be located near Manassas, Virginia in Prince William County. The incinerator is one component of the county's integrated solid waste management program.

### Probabilistic Safety Assessment Symposium in Vienna

The International Atomic Energy Agency (IAEA), jointly with the American Nuclear Society, European Nuclear Society, and OECD Nuclear Energy Agency, is organizing a Symposium on the "Use of Probabilistic Safety Assessment for Operational Safety, PSA 91" to be held June 3-7, 1991, at the Vienna International Centre, Vienna, Austria. Registration forms may be obtained from the Conference Service Section, IAEA Vienna, P.O. Box 100, A-1400 Vienna, Austria (Phone 43-1-2360; FAX 43-1-234564; Telex 1-12645).

### AIChE Offering Risk-Related Courses

Several risk-related courses have been scheduled by the American Institute of Chemical Engineers in conjunction with their regular meetings. The courses are: (1) Safety Analysis and Risk Management for Chemical Process Industry Practitioners; (2) Risk Assessment in the Chemical Industry; (3) Reliability Engineering and Economic Risk Assessment; and (4) Pharmacokinetics and Risk Assessment. Information on these courses may be obtained by calling the AIChE Continuing Education Registrar (Phone 212-705-7526).



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## Some Feedback, Please!

This newsletter is larger by at least four pages than we had anticipated and larger by several pages than what the SRA Council thinks the Society can afford. While admitting that the newsletter size and production costs increase each year (as the type sizes decrease), those of us on the staff maintain that for the majority of the members (the approximately 1600 not attending the annual meetings), we are the only source of Society news and therefore we should tell you everything we know. Also, we should ensure documentation of the Society's history.

The problem is that we don't know what you the members expect of us. Are we correctly assuming that you are interested in how the Society is evolving through internal debates? In what directions the various chapters and sections are taking? In the people who hold offices and receive awards? In individuals who initiate risk-related activities both within and outside the Society? In opportunities for receiving research grants? In other risk-related meetings? In summary reports on risk issues? In the availability of job opportunities?

So that our staff and the Council can determine the proper role for RISK newsletter, won't you please mail or fax us a brief note assessing our performance and informing us of the news items that most (and least) interest you. Our address and fax number are given in the box at the left.

—Lorraine S. Abbott, Editor

P.S. The 1989-90 SRA Council gave permission for RISK newsletter to solicit corporate sponsors under specified guidelines. We would welcome assistance in that area.

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