OAK RIDGE NATIONAL LABORATORY
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX 2008
OAK RIDGE, TENNESSEE 37831-6255

January 19, 1989

ORNL/FTR--3157

DE90 012390

Mr. J. A. Lenhard, Assistant Manager
Energy Research and Development
Department of Energy, Oak Ridge Operations
Post Office Box 2001
Oak Ridge, Tennessee 37831-8600

Dear Mr. Lenhard:

Report of Foreign Travel

Enclosed is a copy of a report by Po-Yung Lu covering recent foreign travel to Japan and Taiwan. The enclosed report is unclassified and does not contain proprietary data.

Sincerely,

Stephen V Kaye
for Alvin W. Trivelpiece
Director

AT:geg

Enclosure

cc: J. T. Ensminger
S. V. Kaye
P. Y. Lu
C. R. Richmond
R. W. Wood, DOE
File - RC

OAK RIDGE NATIONAL LABORATORY

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.
POST OFFICE BOX 2008, OAK RIDGE, TENNESSEE 37831-6285

ORNL

FOREIGN TRIP REPORT

ORNL/FTR-3157

DATE: January 10, 1989

SUBJECT: Report of Foreign Travel of Po-Yung Lu, Group Leader, Chemical Hazard Evaluation Program, Information Research and Analysis Section, Health and Safety Research Division

TO: Alvin W. Trivelpiece

FROM: Po-Yung Lu

PURPOSE: To visit National Institute of Hygienic Sciences (NIHS), Tokyo, Japan, and participate in a Symposium on Health Risk Assessment on Environmental, Occupational, and Life Style Hazards, Taipei, Taiwan.

SITES VISITED: 12/14/1988 National Institute of Hygienic Sciences, Dr. Yusuke Takenaka, Tokyo, Japan

12/19-22/1988 Academia Sinica, Dr. Chien-Jen Chen, Taipei, Taiwan

ABSTRACT:

The traveler was invited to visit NIHS, Tokyo, Japan, to give a lecture to the NIHS staff; traveler then participated in the Symposium on Health Risk Assessment on Environmental, Occupational, and Life Style Hazards, Taipei, Taiwan.

Recommendations of the symposium were summarized as: (1) to establish a research institution for risk assessment on environmental, occupational, and life style hazards; (2) to establish a comprehensive data base for risk assessment associated with the above discipline for further information analysis; (3) to establish public confidence through the risk assessment practice advisory committee to ensure scientific technical expertise; and (4) to communicate the results of risk assessments through mass media and enhance public awareness of environmental contamination and associated social and economic impacts.

REPORT OF FOREIGN TRAVEL OF PO-YUNG LU TO TOYKO, JAPAN, AND TAIPEI, TAIWAN

Environmental management of chemical pollution has expanded its scope from identification, monitoring, and remedial action to active preventive measures. Risk assessment technology has been applied to assure the safe application of chemicals and balance the risk to the public health and environment with the benefit of economic growth. The key is to understand chemicals to the greatest possible extent prior to their applications so as to minimize the consequences. The traveler was invited to give a technical information seminar on chemical safety in Japan and to participate in the Symposium on Health Risk Assessment on Environmental, Occupational, and Life Style Hazards in Taiwan.

Part 1: National Institute of Hygienic Sciences (NIHS), Tokyo, Japan

Dr. Tanimura gave a briefing on NIHS. NIHS was established in 1874 as the Tokyo Drug Control Laboratory at Kanda in Tokyo under the Ministry of Health and Welfare of Japan. NIHS was principally engaged in inspecting the quality of imported drugs; it was later expanded to inspect chemicals in food and water. Today the scope of NIHS includes the occurrence of adverse health effects to various drugs, food contaminants, cosmetics, heavy metals, PCBs, methyl mercury pesticides, and other environmental contaminants.

In 1978, the mission of NIHS was further expanded, and the Biological Safety Research Center (BSRC) was established to supplement the resources to embark on the goal of safe application of chemicals.

NIHS has 13 divisions at the Tokyo headquarters, 1 research center, Osako Branch, and 5 regional experimental stations of medicinal plants.

Dr. Tanimura suggested that I visit BSRC, in addition to visiting Dr. Takenaka's Division of Information on Chemical Safety, prior to my afternoon lecture.

The Division of Information on Chemical Safety has the following major missions. The International Cooperation Programs include: International Register of Potentially Toxic Chemicals; International Program on Chemical Safety - specific contribution on 15 new synthetic pyrithroid insecticides; Organization for Economic Cooperation and Development; and U.S./NIEHS and Japan/NIHS Toxicity testing.

The computerized data bases include: Biological Data Base - focus on mutagenicity, teratogenicity (developmental and reproductive toxicity), and carcinogenicity; and Toxicity Pediction Knowledge Data Base - in planning stage.

The chemical safety evaluations of chemicals are performed by requests from the Ministry of Health and Welfare, Environmental Agency, and Ministry of Labor.

The Current Publication of Information Circulars is an abbreviated current content service to NIHS and some scientists of Ministry of Health and Welfare.

BSRC was established in 1978 and consists of four divisions: Toxicology, Pharmacology, Pathology, and Mutagenesis. Highlights of discussions are:

One-half of a five-story building is occupied by animal rooms with a specific pathogen-free system, where 20,000 animals (monkeys, dogs, rabbits, rats, hamsters, and mice) are housed.

Routine screening tests and basic research are performed to comply with the national and international requests. Research projects are carried out in the BSRC or in collaboration with other national research organizations and academic institutions.

Acute, subacute, and chronic toxicity tests are performed on chemicals, including skin and eye irritation, inhalation toxicity, and reproductive toxicity.

Pharmacological studies are conducted on oriental, herbal drugs.

Mutagenicity screening of food additives, drugs, pesticides, and other industrial chemicals is performed, including the micronucleus test in mice and the application of flow cytometric analysis to this assay.

Several important toxicological publications and a monograph on mutagenicity are of keen interest to the projects undertaken by ORNL. I hope to apply these publications as one of the primary information sources for the Hazardous Substances Data Bank's chemical profile and for other health assessment document preparations.

My lecture, entitled "Overview of Projects in the Chemical Hazard Evaluation Program," was very well received and was followed by considerable discussion and questions. NIHS staff members are very interested in our unique Material Safety Data Sheet preparation and the criteria for selecting key studies.

Part 2: Environmental Protection Administration, Taipei, Taiwan

The Bureau of Environmental Protection was established under the jurisdiction of the Department of Health, Executive Yuan in 1982, and was upgraded to Environmental Protective Administration (EPA/Taiwan) under direct cabinet supervision on August 22, 1988. EPA/Taiwan has six major functions. These include: air quality protection, noise control including vibration and non-ionizing radiation pollution control; water quality protection including surface, waste, ground, lakes, and oceans; solid waste control including hazardous waste refuse management and soil pollution; sanitation and toxic substances control including pesticides, biological agents, and toxic substances; environmental monitoring and data processing; and evaluation of settlement of serious environmental disputes and petitions.

Environmental contamination by heavy metals (copper, zinc, lead, cadmium, and mercury), pesticides, polychlorinated biphenyls, and dioxins is well recognized. This is primarily caused by burning of electric cables to recover metals. There is no doubt that active control measures are under way; one of the measures is the Data Base System for Toxic Chemicals Control Project. This project consists of (1) establishing a chemical data base maintaining comprehensive information on 6000 chemicals frequently used in Taiwan and (2) creating a chemical-related factories inventory (approximately 50,000). This system will be available to local government (county and province levels) to assist in detection of chemical hazard potential; to respond to incidents of chemical toxicity, contamination, and disaster; and to minimize accident potential and environmental, economic, and human loss.

Currently, EPA/Taiwan has access to the Hazardous Substances Data Bank/National Library of Medicine (HSDB/NLM); it has abstracted key information from HSDB and reformatted and translated it into Chinese. This information has become the critical portion of the above data base project. Approximately 60 chemicals were completed (50 are in preparation). I offered to assist in the data base design, quality assurance, and chemical prioritization processes.

Part 3. Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan

The traveler participated in the Symposium on Health Risk Assessment on Environmental, Occupational, and Life Style Hazards from December 19-22, 1988.

The symposium was organized by the Institute of Biomedical Sciences, Academia Sinica, Department of Health, and Department of Environmental Protection Administration to commemorate the 60th Anniversary of Academia Sinica. The meeting adjourned at the Activity Center, Academia Sinica, Taipei. Scientific programs included opening remarks, case studies on risk assessment, concurrent sessions (toxicology, epidemiology, methodology, environmental quality, and behavioral science), special lectures, and poster sessions (see Appendix B).

I presented two papers at the symposium. The toxicology presentation was "Toxicological Information for Hazard Evaluation: The Chemical Unit Risk Estimate Data Base" by Po-Yung Lu, Mary W. Francis, David J. Reisman, and Chris DeRosa. The methodology presentation was "Information Products Used to Support Regulatory Decisions" by Po-Yung Lu, John S. Wassom, Mary W. Francis, and Robert H. Ross. The abstracts are attached (see Appendix B). Both presentations resulted in considerable interest being expressed by attendees.

The objectives of this symposium are rather important with respect to the challenge of chemical pollution as encountered by developing and developed countries. They are: to introduce the concept and the importance of risk assessment to the people in Taiwan; to illustrate to Taiwan the utility of risk assessment in the environment; to encourage further research in risk assessment in Taiwan; and to recommend the establishment of risk assessment policy as a scientific tool for regulatory decision-making and budget allocations.

Risk assessment is a scientific process to characterize and estimate potentially adverse health effects to humans from exposure to environmental hazards so that priority and urgency of preventive measures can be communicated to policy makers and the public at large. It provides a scientific basis on which an environmental policy can be formulated and implemented.
The majority of participants were invited from the U.S. overseas Chinese scientific communities. Dr. William Farland from USEPA and Dr. Hans Weils from Tulane University were also invited participants. A total of 75 papers were orally presented and about 30 posters were displayed during the meetings. Following the presentations, small group panel discussions were held to draw recommendations from the host organizations for consideration of implementation. They are:

To establish a research institution for risk assessment on environmental, occupational, and life style hazards;

to establish a comprehensive data base for risk assessment associated with the above discipline for further information analysis;

to establish public confidence through the risk assessment practice advisory committee to ensure scientific technical expertise; and

to communicate the results of risk assessments through mass media and enhance public awareness of environmental contamination and associated social and economic impacts.

CONCLUSION

This trip has expanded the traveler's technical contacts for potential risk-assessment-associated projects; the technical excellence of ORNL's work and the interests of DOE have been further displayed in professional communities. Potential international cooperation could be developed on the managing of hazardous waste information.

APPENDIX A

Itinery

12/12-13/88	Travel from Knoxville, Tennessee to Tokyo, Japan
12/14-15/88	Tokyo, Japan
12/15-16/88	Travel from Tokyo, Japan to Taipei, Taiwan
12/17/88	Weekend
12/18-23/88	Taipei, Taiwan
12/24-26/88	Weekend and Holidays
12/27-28/88	Chiayi, Taiwan
12/29-30/88	Travel from Taipei, Taiwan to Knoxville, Tennessee

Meetings/Poster Session Agendas and Abstracts

See Appendix B

Persons Contacted and Literature Acquired

See Appendix C

Distribution List

See Appendix D

APPENDIX B

NATIONAL INSTITUTE OF HYGIENIC SCIENCES

18-1, Kamiyoga, 1-chome, Setagaya-ku,
TOKYO 158, JAPAN

Tel. (700) 1141
Cable Address:
KOKUEISHI TOKYO

Day's Program for Dr P Y. Lu

December 14, 1988
National Institute of Hygienic
Sciences, Tokyo

10:00 a.m. : visit to the National Institute of Hygienic Sciences
(Director-General, Acting Director)

10:30 a.m. : visit to the Biological Safety Research Center, NIHS
(Director, Some heads of the Divisions of the Center)

12:00 a.m. : lunch

2:00 p.m. : lecture
provisional title; "On the Activities of the Chemical Hazard Evaluation Program in the Oak Ridge National Laboratory"

3:30 p.m. : discussion with staff of the Division of Information on Chemical Safety, NIHS

生活環境危害評估研討會

SYMPOSIUM ON HEALTH RISK ASSESSMENT ON ENVIRONMENTAL, OCCUPATIONAL AND LIFE STYLE HAZARDS

December 20 - 22, 1988
Taipei, Taiwan, Republic of China

Dec. 20	
8:30-- 9:00 AM	Opening Remarks
	Symposium
	Poster Session
12:00-- 1:30 PM	Lunch
1:30-- 5:30 PM	Case Studies on Risk Assessment
	Poster Session
Dec. 21	
8:30-- 12:20 PM	Case Studies on Risk Assessment
	Poster Session
12:20-- 1:30 PM	Lunch
1:30-- 5:30 PM	Concurrent Sessions: Session 1: Toxicology Session 2: Epidemiology Session 3: Methodology Session 4: Environmental Quality Session 5: Behavioral Science
	Poster Session
Dec. 22	
8:30-- 12:00 PM	Symposium
12:00-- 1:30 PM	Lunch
1:30-- 3:00 PM	Symposium

生活環境危害評估研討會

SYMPOSIUM ON HEALTH RISK ASSESSMENT ON ENVIRONMENTAL, OCCUPATIONAL AND LIFE STYLE HAZARDS

Oral presentation and poster abstract form

Type abstract within space below. DEADLINE for receipt is Sept. 30, 1988.

TOXICOLOGICAL INFORMATION FOR HAZARD EVALUATION: THE CHEMICAL UNIT RISK ESTIMATE DATABASE. Po-Yung Lu, Mary W. Francis, Chemical Hazard Evaluation Program, Oak Ridge National Laboratory,* Oak Ridge, TN 37831, David J. Reisman, Chris DeRosa, Environmental Criteria and Assessment Office, U.S. Environmental Protection Agency, Cincinnati, OH 45268

Various health hazard assessments have been conducted to ensure safe application of chemical agents. Chemical carcinogenicity and health risk assessments are key scientific bases for regulatory actions. These methods are relatively new and are still under development. Quite often, different protocols can lead to conflicting results that could be misleading. Furthermore, expensive experimental evaluations and/or risk assessments are often repeated, without reaching definitive conclusions. To ensure the best derived risk assessment values and to communicate this information, a comprehensive Chemical Unit Risk Estimate (CURE) database has been designed and implemented. CURE is an online, interactive database that provides (1) calculation of some numeric risk estimates (e.g., RfD, Q1*, RQ...); (2) compilation of risk estimates and associated experimental data, including target animals and organs, effects and route of exposure, used to generate the estimates; (3) side-by-side comparison of various related risk estimates; (4) an historical collection of estimates yielding a better perspective in the development of risk values; and (5) a management information system for EPA health effects assessment documents.

*Operated by Martin Marietta Energy Systems, Inc., for the U.S. Department of Energy under Contract No. DE-AC05-840R21400.

Title: Toxicology for Hazard Evaluation: The Chemical Unit Risk Estimate Database

Author(s): P.Y. Lu, M.W. Francis, D.J. Reisman, C. DeRosa

Mailing Address of First Author: P.O. Box 2008, Bld. 2001, MS 6050, Chemical Hazard Evaluation Program, Oak Ridge National Laboratory, Oak Ridge TN 37831-6050

Date: October 5, 1988 Phone: 615-574-7587

Signature of First Author: Po-Yung Lu

生活環境危害評估研討會

SYMPOSIUM ON HEALTH RISK ASSESSMENT ON ENVIRONMENTAL, OCCUPATIONAL AND LIFE STYLE HAZARDS

Oral presentation and poster abstract form

Type abstract within space below. DEADLINE for receipt is Sept. 30, 1988.

INFORMATION PRODUCTS USED TO SUPPORT REGULATORY DECISIONS

P. Y. Lu, J. S. Wassom, R. H. Ross, and M. W. Francis, Chemical Hazard Evaluation Program, Oak Ridge National Labcratory,* Oak Ridge, TN 37831

Environmental contamination by toxic/hazardous substances can result in adverse effects on human health, deteriorated environmental quality, and toxicity to plant and animal species. Contamination by environmental pollutants results primarily from the use of chemicals in industrial, agricultural, and military operations or the accidental release of chemicals during the manufacturing or transportation processes. To minimize the adverse health and environmental impact of chemicals released to the environment, Congress has mandated state and federal agencies to promulgate and enforce various environmental laws and regulations. To assist these regulatory agencies in the promulgation and enforcement process, a variety of comprehensive and peer-reviewed information products are prepared by the Oak Ridge National Laboratory. Selected examples of these information products, including Toxicological Profiles, Reportable Quantity and Reference Dose Profiles, Water Quality Criteria Documents, Chemical Hazard Information Profiles, Tier-1 Health Effects Assessment Reports, Genetic-Toxicology (Gene-Tox) Data Base, Chemical Unit Risk Estimate File, and the Hazardous Substances Data Bank, will be reviewed. The respective procedures of document/data base preparation used by each activity will be illustrated, along with the use or application of the end product in the decision process.

*Operated by Martin Marietta Energy Systems, Inc., for the U.S. Department of Energy under Contract No. DE-AC05-840R21400.

Title: Toxicology Information Used to Support Regulatory Decisions

Author(s): P.Y. Lu, J.S. Wassom, R.H. Ross, and M.W. Francis

Mailing Address of First Author: P.O. Box 2008, Bldg. 2001, MS 6050, Chemical Hazard Evaluation Program, Oak Ridge National Laboratory, Oak Ridge TN 37831-6050

Date: October 5, 1988 Phone: 615-574-7587

Signature of First Author: Po-Yung Lu

APPENDIX C

People Contacted

December 14, 1988: Visited National Institute for Hygienic Sciences, Tokyo, Japan.

Dr. A. Tanimura, Director General
Dr. M. Uchiyama, Deputy Director General
Dr. Y. Takenaka, Director
Dr. J. Sekizawa, Chief
Dr. M. Tobe, Director of BSRC
Dr. A. Kurokawa, Head of Toxicology
Dr. A. Takenaka, Head of Pharmacology
Dr. Y. Hayashi, Head of Pathology
Dr. M. Ishidate, Head of Mutagenesis

December 19, 1988: Visited Environmental Protection Administration (EPA), Taipei, Taiwan (EPA/Taiwan).

Dr. E. Chien, Director General, EPA/Taiwan
Dr. W. Farland, U.S. Environmental Protection Agency (USEPA)
Dr. H. Weil, Tulane University
Dr. Y. Chen, Department Head, EPA/Taiwan

Literature Received

Reprints:

- Ishidate, M. Jr., Harnois, M.C., and Sofuni, T. A comparative analysis of data on the elastogenicity of 951 chemical substances tested in mammalian cell cultures. Mutation Research 195:151-213, 1988.

- Ishidate, M. Jr., Sofuni, T., Yoshi Kawa, K., Hayashi, M., Nohmi, T., Sawada, M., and Matsuoka, A. Primary mutagenicity screening of food additives currently used in Japan. Food Chemistry and Toxicology 22:623-636, 1984.

- Ishidate, M. Jr., A proposed battery of tests for the initial evaluation of the mutagenic potential of medicinal and industrial chemicals. Mutation Research 205:397-407, 1988.

Book:

- Ishidate, M. Jr., Data book of chromosomal aberration test in vitro. Rev. Ed. Elsevier, 1988, pp. 484.