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**COVER SHEET
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Destination(s) and Dates for

Which Trip Report Being Submitted: Taiwan, Republic of China 2/26/87-3/08/87

Name of Traveler: Charles Stephen Sims

Joint Trip Report ☒ **Yes**

☐ **No**

If so, Name of Other Traveler(s): Richard Edward Swaja

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ORNL

FOREIGN TRIP REPORT

ORNL/FTR-2505

DATE: March 20, 1987

SUBJECT: Report of Foreign Travel of Charles Stephen Sims, Group Leader,
and Richard Edward Swaja, Senior Research Staff Member, Health
and Safety Research Division

TO: Herman Postma

FROM: Charles Stephen Sims and Richard Edward Swaja

PURPOSE: To serve as conference coordinator and technical program chairman
for the International Conference on Radiation Dosimetry and
Safety (RDAS) and to present short courses on radiation dosimetry.

SITES

VISITED:	2/28/1987	Taipower Headquarters	Taipei, Taiwan	J. H. Chen
	3/1-4/1987	RDAS Conference	Taipei, Taiwan	I. L. Wang
	3/5-6/1987	Taipower Radiation Laboratory	Chinshan, Taiwan	P. Y. Hwang
	3/7/1987	Maanshan Nuclear Plant	Maanshan, Taiwan	T. S. Sung
	3/7/1987	AEC Radiation Monitoring Center	Kaohsiung, Taiwan	Y. M. Lin

ABSTRACT: At the request of the Nuclear Energy Society and the American Nuclear Society of the Republic of China, the travelers attended the International Conference on Radiation Dosimetry and Safety in Taipei, Taiwan, during March 1-4, 1987, to serve as conference coordinator and technical program chairman. Both travelers also presented technical papers dealing with neutron personnel dosimetry at the meeting. The conference was attended by more than 200 people and was described as one of the biggest events of recent times for the nuclear community of the Republic of China. Following the conference, the travelers presented short courses in neutron, beta, and internal radiation dosimetry at the Taipower Radiation Laboratory for about 40 attendees from Taiwan, Japan, and the United States. The travelers also toured the Maanshan Nuclear Plant in the southern part of the country and the Atomic Energy Council's Radiation Monitoring Center in Kaohsiung. Through the conference attendance, short courses, and tours, the travelers gained information concerning radiation protection programs and philosophies in the Far East and discussed possible continued future collaborative training and research efforts with various agencies in the Republic of China.

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REPORT OF THE TRAVEL OF CHARLES STEPHEN SIMS AND RICHARD EDWARD SWAJA
TO TAIWAN, REPUBLIC OF CHINA

The travelers departed Knoxville, Tennessee, on February 26, 1987, and arrived in Taipei, Taiwan, on February 27, 1987. The primary purpose of this travel was to attend the International Conference on Radiation Dosimetry and Safety at the Howard Plaza Hotel in Taipei. Dr. C. S. Sims was the conference coordinator and Dr. R. E. Swaja was the technical program chairman for this meeting. Other attendees from Oak Ridge National Laboratory included Dr. Herman Postma, Laboratory Director, who was the conference general co-chairman, and Dr. Keith Eckerman of the Health and Safety Research Division. Other attendees from the United States included Mr. D. E. Hankins of the Lawrence Livermore National Laboratory, Dr. J. L. Alvarez of EG&G Idaho, Mr. R. T. Greene of the IT Corporation, Dr. Martin Rozenfeld of the Rush Memorial Hospital, and Dr. John Poston of Texas A&M University.

On February 28, the travelers attended a conference staff meeting at Taipower Headquarters in downtown Taipei. This conference was attended by various committee chairpeople and was presided by J. H. Chen, president of Taipower and the conference general chairman. The status of meeting preparations was reviewed and several conference-related items were finalized. Following this briefing, attendees were given a tour of the Taipower Emergency Control Center which is also at the Taipower Headquarters. This tour was conducted by Mr. I. L. Wang, who is the Emergency Planning Coordinator at Taipower. The Emergency Control Center was patterned after those at many nuclear utilities in the United States and has the latest computerized displays, atmospheric transport models, and communications capabilities. The status of all Taipower facilities can be monitored at the Emergency Control Center, and communications with nuclear plants and government agencies are also available.

A meeting of the Technical Program Committee was held at the Howard Plaza Hotel on March 1 to discuss final plans for the conference and to make certain that all session chairpeople understood their duties. Dr. R. E. Swaja presided at this meeting and reviewed plans for the short courses as well as details of the conference.

The Radiation Dosimetry and Safety Conference was held during March 2-4 at the Howard Plaza Hotel in Taipei. A total of 66 papers were included of which 50 were oral presentations and 16 were poster displays. There were 12 sessions during the three-day meeting which dealt with beta/gamma dosimetry, neutron dosimetry, internal dosimetry, radiation dosimetry and safety, environmental monitoring, and radiation management and regulation. Most of the oral presentations were based on applied dosimetry work or radiation protection experience as contrasted with basic research. Many of the presentations by Taiwanese participants indicated that their radiation protection programs are patterned very closely after those in the United States. Regulatory guidelines, performance testing programs, and dosimetry techniques are based on those used and recommended by various international standards agencies and United States facilities. One major difference between Taiwanese and United States radiation protection programs is that the utility, research, and regulatory agencies

in Taiwan seem to have a more cooperative relationship than those in the United States where the interrelationship of these types of agencies is almost adversarial at times.

Over 200 people from Taiwan, the United States, Japan, Germany, Italy, and Sweden attended this conference. Oral presentations were generally of the high quality commensurate with international technical meetings. Poster displays were generally well prepared and of slightly higher quality than those at most technical meetings, and the sessions were well attended. Based on news coverage and local enthusiasm, this conference was one of the biggest events of recent times for the nuclear community in the Far East.

Following the formal meeting, short courses on beta, neutron, and internal dosimetry were presented to about 40 people at the Taipower Radiation Laboratory in Chinshan, Taiwan, on March 5 and 6. Lectures on various aspects of neutron dosimetry were given by R. E. Swaja, C. S. Sims, R. T. Greene, and D. E. Hankins. A lecture on the fundamentals of beta dosimetry was presented by J. L. Alvarez, and a lecture on internal dosimetry was given by J. W. Poston. Most attendees were technicians or managers from the Taipower Company or the Institute of Nuclear Energy Research or instructors or students from the National Tsing Hua University. Questions following the lectures were primarily aimed at improving existing external and internal dosimetry monitoring programs at these agencies. Items of most interest included basic dosimeter design and evaluation methods, development of evaluation algorithms, and reporting of dose equivalents for occupational radiation protection.

The travelers departed Taipei on March 6 and arrived in Maanshan in the southern part of the country. On March 7, they toured the Maanshan Nuclear Plant with Mr. T. S. Sung, Plant Manager, and Mr. Y. R. Hwang, Manager of the Radiation Laboratory. The plant consists of two 950 MW pressurized water reactors and is very similar to commercial reactor plants in the United States. This site was the scene of a serious turbine fire in 1985 which significantly reduced plant capabilities for several months. In addition to the main control areas, there is a simulator which is used for reactor operator and manager training onsite. Taipower is very concerned with having a constant supply of trained operators and having their existing operators undergo periodic refresher courses on the simulator system which exactly models the plant control facilities.

Following the Maanshan tour, the travelers went to Kaohsiung to tour the Atomic Energy Council's Radiation Monitoring Center with the Director, Y. M. Lin. This center is primarily concerned with environmental monitoring of direct radiation levels, airborne contamination, and radiation levels in soil, water, and foodstuffs. Capability exists to obtain on-line readings of direct radiation levels near nuclear plants and at various locations in Taiwan based on sodium iodide detector readings. In addition, periodic external radiation level measurements are obtained based on calcium sulphate dosimeters placed at several locations around the country. Water, soil, and foodstuff samples are also periodically monitored for contamination or unusually high radiation levels. During a presentation on the capabilities and experiences of the Radiation Monitoring Center, data were presented which indicated that background external radiation levels in

Taiwan are somewhat lower than those encountered in most areas of the United States.

This travel provided the following observations:

1. Radiation dosimetry programs at Taiwan utilities and research organizations are patterned after those existing in the United States. Techniques used for external and internal dosimetry are the same ones used by United States utilities, but experience and overall capabilities are probably not equal to those of the best United States facilities.

2. The Taiwanese nuclear power program, which was growing very rapidly several years ago, has slowed considerably with the advent of an antinuclear movement in Taiwan. Their utility managers and government officials are aware that educating the public will be very important in determining the future of nuclear power in their country. However, as in the United States, they still have not determined an effective way to do this.

3. The next several years should produce some kind of a dosimetry testing or accreditation program similar to those being implemented in the United States. The Taiwanese are very serious about doing the best that they can do with regard to radiation protection and they view these accreditation programs as a method to ensure at least some quality dosimetry.

4. The Taiwanese still have a strong desire to continue cooperative efforts with the United States in general and with the Oak Ridge National Laboratory in particular to develop their radiation protection programs. Taipower, the Institute of Nuclear Energy Research, and the National Tsing Hua University plan to continue participation in dosimetry intercomparison studies and training programs conducted at Oak Ridge National Laboratory. Also, based on the success of the Radiation Dosimetry and Safety Conference, the sponsors indicated that they will probably want to conduct another similar meeting in three or four years with the assistance of Oak Ridge National Laboratory.

SUMMARY

This trip was very productive and rewarding for the travelers. The primary subject matter of radiation dosimetry is directly related to their technical interests and current work assignments. The technical reputations of DOE, ORNL, and the travelers will be enhanced by their conference participation and interactions with officials in the Republic of China who are presently shaping their radiation protection programs. This travel provided the travelers with the opportunity to observe the status of and contribute to the development of radiation protection programs in the Far East and to promote continued cooperation between Taiwan and the United States in related areas.

APPENDIX

Itinerary

2/26-27/1987	Travel from Knoxville, Tennessee, to Taipei, Taiwan.
2/28/1987	Review of Taipower Emergency Control Center and meeting of conference committee chairpeople at Taipower Headquarters.
3/1/1987	Technical Program Committee meeting at the Howard Plaza Hotel in Taipei.
3/2-4/1987	Attend International Conference on Radiation Dosimetry and Safety, Taipei, Taiwan.
3/5-6/1987	Conduct short courses on radiation dosimetry at the Taipower Radiation Laboratory in Chinshan, Taiwan.
3/7/1987	Tour Maanshan Nuclear Power Plant in Maanshan, Taiwan, and visit Atomic Energy Council's Radiation Monitoring Center in Kaohsiung, Taiwan.
3/8/1987	Travel from Taipei, Taiwan, to Knoxville, Tennessee.

Contacts

1. Taipower Personnel

J. H. Chen - President, Conference General Chairman
 M. S. Tsai - Director of Nuclear Operations, Conference Coordinator
 I. L. Wang - Health Physics Manager, Conference Coordinator
 E. Lin - Nuclear Power Director, Technical Program Committee
 P. C. Chyen - Radiation Protection Manager, Technical Program Committee
 Y. R. Hwang - Radiation Protection Manager at Maanshan Nuclear Plant, Technical Program Committee
 C. P. Yang - Health Physicist, Coordinating Committee
 S. L. Heng - Publicity Committee Chairperson
 C. Y. Chu - Publications Chairperson
 Y. C. Peng - Publications Chairperson
 P. R. Hwang - Manager of Radiation Laboratory
 T. S. Sung - Manager of Maanshan Nuclear Plant

2. Atomic Energy Council Personnel

Y. H. Lee - Secretary General, Keynote Speaker
 Y. C. Yang - Director of Radiation Protection, Technical Program Committee
 C. M. Tsai - Radwaste Director, Technical Program Committee
 Y. S. Tsay - Conference Coordinating Committee
 Y. M. Lin - Director of Radiation Monitoring Center

3. National Tsing Hua University Personnel

P. S. Weng - Technical Program Committee
 C. J. Tung - Technical Program Committee

4. Institute of Nuclear Energy Research Personnel

J. C. Chou - Director, Technical Program Committee
 S. J. Su - Technical Program Committee
 W. L. Chen - Director of Health Physics, Technical Program Committee

5. Other Contacts

M. Fujita - Chiyoda Safety Appliance Company, Japan
 H. Schraube - Gesellschaft fur Strahlen-und Umweltforschung,
 Federal Republic of Germany
 C. S. Wu - United States Nuclear Regulatory Commission
 A. N. Tse - United States Nuclear Regulatory Commission

Literature Acquired

1. Preliminary Proceedings of the International Conference on Radiation Dosimetry and Safety, Taipei, Taiwan, March 1-4, 1987.
2. Ecological Survey on Coastal Water Adjacent to Nuclear Power Plants in Taiwan, Taipower Report issued in 1986.
3. Short Course Text - Personnel Radiation Dosimetry, March 5-6, 1987.

DISTRIBUTION

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