FINAL PROGRESS REPORT

NORTHWEST CENTER FOR OCCUPATIONAL HEALTH AND SAFETY

(a NIOSH-funded Education and Research Center)

PROJECT PERIOD: JULY 1, 1997 - JUNE 30, 2002

GRANT NUMBER: T42/CCT010418

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30 September, 2002

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ABSTRACT

A. Purpose and Program Characteristics

This report summarizes activity of the Northwest Occupational Health and Safety Education and Research Center for 1 July, 1997 through 30 June 2002. The purpose of this Center program is to educate professionals specializing in occupational health and safety fields for the Pacific Northwest (Region X) and the nation, and to provide continuing education courses and outreach programs in the field to practicing specialists and citizens of this region. Established graduate academic programs in Industrial Hygiene, Occupational Safety, Occupational and Environmental Medicine, Occupational Health Nursing, and Hazardous Substance Management have continued with modest expansion in size and with special emphasis on maintaining the quality of the research and educational experiences of the trainees. These efforts focused on developing the leadership of the Center, recruitment of faculty with strong research orientation, and more comprehensive integration of the Center programs with the other research, education, and service activities of the sponsoring departments: Environmental Health, Epidemiology, and Health Services in the School of Public Health and Community Medicine, Medicine in the School of Medicine, and Psychosocial and Community Health in the School of Nursing. Continuing Education, Outreach, and specific training programs in Hazardous Substance Management for working professionals are also key components of the Center, whose goal is to reach the greatest possible number of persons working in occupational health and safety in the region.

Trainees

Students include masters degree candidates specializing in Industrial Hygiene (IH), Occupational Health Nursing (OHN), Occupational Medicine (OM), and Occupational Safety (OS), as well as Ph.D. candidates in IH and in OHN. During this period 8 to 10 IH students working toward the M.S. degree were admitted annually for a total of 40-50 graduates over the 5-year period; in addition, 1 to 2 doctoral candidates annually were enrolled. 10 OHN students received M.N. degrees each year for a total of 50 graduates, and 1 to 2 Ph.D. students completed the degree requirements per year. Three to four physicians were admitted each year to the O.E.M. residency program leading to the M.P.H. degree. Two to three students entered the Occupational Safety M.S. program each year, and a total of 8 graduated during the 5 years. All students met the Graduate School and the School of Public Health and Community Medicine or School of Nursing admission and graduate requirements. In additional, approximately 400 trainees participated in continuing education programs during each year.

Training Facilities

Programs were carried out in the classrooms, laboratories and field research facilities of the Departments of Environmental Health and Health Services; the offices and classrooms of the Department of Psychosocial and Community Health Nursing; the conference rooms, offices and clinics of the Harborview Medical Center Occupational Medicine Clinic, and in related facilities (library and computer laboratories) in the University of Washington's Warren G. Magnuson

Health Sciences Center. Clinic and field practice experience for OEM residents and for IH and Safety students utilized facilities of clinical and affiliate faculty in regional industries and institutions (e.g., the Boeing Company, Hanford Environmental Health Foundation, the Washington Department of Labor and Industries, and Weyerhaeuser Corporation). All of the academic and continuing education programs associated with this ERC are located on or near the main UW campus in the city of Seattle, providing frequent and effective interaction among the trainees from each discipline.

SUMMARY OF SIGNIFICANT FINDINGS

A. INDUSTRIAL HYGIENE PROGRAM

Dr. Noah Seixas and Dr. Michael Yost were promoted the rank of Associate Professor. Each plays a major role in both the teaching and research activities in Industrial Hygiene and in the Department of Environmental Health. Dr. Yost is now Director of the Industrial Hygiene & Safety program in the Department; Dr. Seixas is the Graduate program coordinator for the Department of Environmental Health.

•Drs. Richard Fenske and Michael Morgan were promoted to the rank of Professor; they also continue to have an active role in teaching and research in the Industrial Hygiene Program.

•Thirty trainees completed the requirements for graduation from the program, of which two earned a Ph.D. with emphasis in Industrial Hygiene. All have found employment in the field of Industrial Hygiene and Safety. In addition, five students completed the MS degree requirements and graduated at the end of Spring quarter, 2001.

• Peter W Johnson, Ph.D. MPH, was appointed to the rank of Assistant Professor and will lead the MS ERC program in Occupational Safety. He joins Mr. Rick Gleason and Ms. Kate Stewart who are lecturers in Safety and Ergonomics, respectively. The latter program is a strong complement to the long-standing educational program in Industrial Hygiene

• Students in the program were honored by scholarship awards from the American Industrial Hygiene Association Foundation and the Pacific Northwest Section of the American Industrial Hygiene Association. IH program students were recipients of prestigious fellowships from the Oak Ridge Institute for Science and Engineering, the US EPA STAR fellowship program, and the National Defense Science and Engineering Graduate Fellowship Program.

•Dr. Steven E. Guffey left the University of Washington (September 2000) to take a position at West Virginia University; a search is underway to replace this vacancy in the IH program. Rolf Hahne, Ph.D, CIH, director of the Environmental Health Laboratory, has been appointed as a lecturer part-time in the IH program to assist with teaching duties during the transition period.

•Program faculty, staff and students have presented research papers at each annual American Industrial Hygiene Conference and Exhibition.

•The research training portion of the program was enhanced by the awarding of several major research grants from extramural sources to members of the core program faculty.

•The curriculum for the MS degree was thoroughly reviewed and accredited by ABET.

B. OCCUPATIONAL HEALTH NURSING PROGRAM

The occupational health nursing program faculty have been attentive to our identified goals and objectives related to the recruitment and training of Master's and Ph.D. in Nursing Science students, the enhancement of our program through the student and faculty contributions, and the

development and dissemination of research activities that will benefit and contribute to the future practice of occupational health nursing.

- A total of 25 students have completed the occupational health nursing program since July 1, 1996: 18 administration/management students, 6 occupational nurse practitioners, and 1 PhD in Nursing Science student. An additional 7 students are expected to complete the program in the year 2002. Six of these will receive their Master of Nursing (MN) degrees; one will receive a PhD in Nursing Science degree.

- The occupational health nursing students and faculty continue to contribute to occupational health and safety in multiple capacities. For example, Ms. Michelle Kom Gochnour serves as a member of AAOHN's Research and Ethics Committee. Dr. Mary Salazar serves as Chair of the American Board for Occupational Health Nurses, and Managing Editor of the second edition of AAOHN's core curriculum for occupational health nursing. Dr. Randal Beaton serves as the School of Nursing's safety and workplace violence representative. Dr. Marcia Killien serves as a co-Director of Center of Women's Health Research, which supports and encourages research related to women and work.

- Among the funded research projects conducted by OHN faculty this last year are a study of barriers to the use of respiratory equipment among hazardous waste workers, a job analysis of occupational health nursing roles, and a study of subcontracted workers conducted by Dr. Salazar. Dr. Randal Beaton is conducting a study testing a leadership intervention that is intended to address occupational stress in fire service personnel. Dr. Marcia Killien is conducting a feasibility study of the health of women moving from welfare to work.

- Occupational health nursing faculty and students are regularly recognized for the excellence of their work and their contributions to worker health and safety. For example, Dr. Salazar was inducted as a member of AAOHN's Year 2000 Class of Fellows, Ms. Zimmer was inducted as a Fellow by the American Academy of Nursing, and Dr. Beaton received a commendation award from the IAFF for 'outstanding contributions and dedication to health and safety.' Students who received awards include Diane Anderson (ABOHN Research Award), Tiffany Dickenson (AAOHN Otis Clapp Award), Betsy Gilbert and Stephanie Rowan (Citizens of the World Awards).

- OHN faculty are committed to education and outreach as demonstrated by their many consultative activities. For example, Dr. Salazar served on an expert panel for the Agency for Healthcare Research and Quality to assist with the development of this agency's Work Initiative and as a member of the Agency for Toxic Substances and Disease Registry Task Force, Hanford Community Health Project: Education and Outreach. Ms. Gochnour has consulted with several organizations regarding ergonomic accommodations. She also served as the health care representative on the Washington State Department of Labor and Industries Ergonomic Task Force. Dr. Randal Beaton regularly provides consultation on fire fighter stress, nationally (i.e., University of Memphis, UCLA, University of Pittsburgh) and internationally (University of Tübingen, Germany, Bogotá, Columbia, South Africa).

C. OCCUPATIONAL AND ENVIRONMENTAL MEDICINE PROGRAM

During the past five years, the program has graduated all 10 of the residents entering the program since the start of the funding period on July 1, 1997. Three additional residents will enter the final fiscal year of the period.

- The Program has developed a number of practicum experiences to provide residents prevention-oriented, clinically relevant experience in industrial Occupational Medicine settings. Each rotation focuses on comprehensive "real-world" application of administrative and clinical prevention in Occupational Medicine, with complimentary areas of emphasis.

- Formal worksite visits for clinical evaluations now involve Occupational Medicine residents, and students in the Occupational Health Nursing and Industrial Hygiene & Safety Programs, who participate together in worksite visits under the supervision of a certified Industrial Hygienist.

- Formal inter-disciplinary teams of students regularly conduct group presentations in the weekly Environmental Health Seminar (ENVH 596), under the supervision of Dr. Joel Kaufman. These teams involve students in Occupational Medicine, Occupational Health Nursing, Industrial Hygiene, Occupational Safety, and Toxicology

- Following the transfer of Dr. Scott Barnhart to Medical Director of Harborview Medical Center, Dr. Matthew Keifer has assumed the position of Program Director, and Dr. Carl Brodkin, previously the Associate Director of the Residency Program, has assumed the position of Residency Director.

- Harborview Medical Center serves as the major on-site clinical facility for the program, with Occupational Medicine Clinic offered 4 half-days per week. In November 1999, Harborview received formal notification of its "award of special designation of commendation" for the second consecutive time by the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO).

D. OCCUPATIONAL SAFETY PROGRAM

In February 2001 Peter W. Johnson was appointed assistant professor in the Industrial Hygiene & Safety Program to strengthen our emphasis in ergonomics. Dr. Johnson holds a Ph.D. in Bioengineering from the University of California – Berkeley and will be in charge of further developing the safety and ergonomics curriculum.

- In the Spring Quarter of 2001 Occupational Biomechanics was added to our course offerings, and taught by Dr. Peter Johnson. It was also offered jointly with Industrial Engineering.

- Two affiliate faculty with expertise in the area of safety and ergonomics were added to the department (Drs. Barbara Silverstein and Peregrin Spielholz).

- Faculty and graduates of the safety program authored 14 refereed publications during the reporting period.
- One student earned a PhD degree and eight students earned the MS degree during the reporting period, and one student is currently enrolled in the program through the Department of Environmental Health.
- The students have established a student chapter of the American Society of Safety Engineers (ASSE) and collaborate regularly with the Puget Sound Chapter of ASSE at monthly technical meetings.

E. HEALTH SERVICES RESEARCH TRAINING PROGRAM

Despite concerted efforts, the Health Services Research Training Program was unable to recruit trainees for the 02 grant year (July 2000 to June 2001). We extended offers to two individuals who were being highly recruited elsewhere (Johns Hopkins and UC Berkeley), and both of these individuals accepted offers at these institutions. We also admitted a post-doctoral fellow who was starting a residency in occupational medicine. Unfortunately, due to serious family illness problems, this person withdrew from the program and moved back to Montana. We have extended offers to three individuals for admission to the program starting next fall (2002). All three of these individuals have excellent academic records. They are being recruited by other well known health policy research Ph.D. programs (Harvard, Johns Hopkins, University of North Carolina). We will continue efforts to attract high caliber candidates into the program.

F. HAZARDOUS SUBSTANCE ACADEMIC TRAINING PROGRAM

The goal of this program is to provide specialty education in several aspects of hazardous substance management to students enrolled in the Industrial Hygiene program. Support is requested for five IH students who indicate when they apply to the program that they are interested in pursuing the specialty option, and whose career goals include work in hazardous substance management. Students completing this option will be qualified to pass the certification examination in industrial hygiene, as well as those designated for hazardous materials management. The key elements of the program are:

1.) strong course offerings covering the industrial hygiene, engineering and management aspects of dealing with human exposure to hazardous substances at a variety of sites, but focusing on hazardous waste disposal sites; and

2.) a vigorous (required) thesis research program, consistent with the major emphasis placed on research by all ERC programs. Specialty option students will be encouraged to pursue thesis research projects involving field investigation of worker exposure, mechanisms of environmental transport, or control of exposure at local hazardous material facilities.

Ten students graduated from the program during the five-year period, and all are employed in areas directly or indirectly involved in hazardous materials management. Significant research support has been acquired by program faculty, through which student experience in hazardous material has been augmented.

G. HAZARDOUS SUBSTANCE TRAINING PROGRAM

The following are the highlights of the 1997-2002 Hazardous Substance Training Program:

- Hazardous substance training programs that meet the needs of public sector employees in the region.

  Eighty percent of the 1,238 attendees at the 1997-2002 hazardous substance training courses were from federal, state, and local government agencies. Participants included environmental health specialists, safety professionals, industrial hygienists, engineers, training coordinators, worker representatives, and toxicologists.

- Programs that include qualified faculty from the public and private sectors with theoretical and practical knowledge of protecting workers and the general public from hazardous substances.

  Faculty included experts in hazardous substances from the New York/New Jersey ERC and the University of Washington Department of Environmental Health; from state and federal government agencies, including the Departments of Transportation and Labor and Industries, and the U.S. Coast Guard; and from local agencies, including fire and emergency management departments. Speakers also came from the private sector, including Prezant Associates, Inc. (an environmental health and safety consulting firm), St. Joseph's Hospital, and Olympic Medical Center.

- Involvement of representatives of the target audience in planning and implementing programs.

  The Northwest Center works closely with an advisory committee of representatives from local, state, and national agencies that stay directly involved as courses are developed and presented.

- Courses which meet the unique needs of public employees in the Northwest.

  The Hazardous Materials Incidents: Improving Interagency Response course is a unique program that brings together representatives from key federal, state, and local agencies who respond to hazardous material incidents. The course helps them understand the role of each agency and learn about important resources available to them during an incident response.

H. CONTINUING EDUCATION AND OUTREACH PROGRAM

The Continuing Education program exceeded its goals set for the 1997-2002 grant period:

C. To present excellent Continuing Education programs each year that meet regional and national needs

From 21 to 58 courses have been presented each year. Course topics have ranged from spirometry training to preventing workplace violence. An increase in work-site based customized training and web-based courses has added significantly to the number of courses offered.

D. To obtain highly qualified faculty from the public and private sector with theoretical and practical knowledge of the issues presented

Over the last five years, speakers have included faculty from the University Washington and nationally known experts from other universities, government agencies, medical facilities, private industry, unions, and law and consulting firms.

E. To attract at least 650 occupational safety and health professionals each year

This goal has been met or exceeded every year but one: 784 industrial hygienists, safety professionals, nurses and physicians attended courses in 96/97, 841 in 97/98, 965 in 98/99, 582 in 99/00, and 666 in 00/01.

F. To present at least one course each year directed towards persons not trained in occupational safety and health

Courses on preventing occupational safety and health problems directed to non-safety and health professionals included Preventing Workplace Violence; Environmental Health Issues in Children: What Pediatricians and other Primary Care Providers Need to Know; Indoor Air Quality at School and at Home; Health Hazards of Cosmetology; Curriculum Workshop for Middle and High School Educators; and Environmental Health for Reporters.

G. To involve representatives of the target audience in planning and implementing programs

The Center works closely with national and regional associations, agencies, and other educational institutions in presenting courses. A course is presented annually at the Washington Governor's Industrial Safety and Health Conference that is developed by an advisory committee composed of representatives of labor, management, and academia. In Alaska, a consortia of organizations, including the Denali Safety Council, University of Alaska, the Anchorage chapters of ASSE and AIHA, work with the Center to identify needs and present courses.

H. To hold at least two courses a year in Alaska, Oregon, and Eastern Washington or Idaho

Over the past five years a number of courses have been held outside the Puget Sound area: Six in Alaska, fifteen in Eastern Washington, and seven in Oregon.

FULL REPORT

INDUSTRIAL HYGIENE

Student publications- Ph.D Dissertations during project period

The following table lists Ph.D. graduates during the last training period and their dissertation title.

NAME	DEGREE	DISSERTATION TOPIC	ADVISOR
Ed Doran	PhD 2000	Measuring and modeling dermal absorption of pesticide residues	Fenske
Peregrin Spielholz	PhD 1999 (safety)	A comparison of upper extremity physical risk factor measurement methods.	Morgan
Chensheng Lu	PhD,1996	Pesticide biomonitoring: A feasibility study of saliva sampling in rats.	Fenske
Cheryl Hart	PhD, 1998	Theory and evaluation of a new physiologic sampling pump.	Yost

In addition, several of these Ph.D. students have published papers related to their work, which are included in the complete listing of papers for the training period given in appendix H. The Ph.D. program currently has 10 continuing students, and one student admitted to the program starting in the fall of 2001. Students identified as "rotating" are still completing their first year of study, which requires them to perform 3 one quarter long lab rotations under the direction of a faculty mentor to allow students to become familiar with current research projects before deciding on a formal dissertation topic.

Continuing IH Ph.D. Students

Student Name	Research Topic	Preceptor
Elgethun,Kai	Pesticide exposures in children and workers	Richard Fenske
Johns,Doug	Rotating – topic not selected	Mike Morgan
Wilder,Lynn	Biological monitoring	Richard Fenske
Wu,Chang-Fu	Optical sensing of chemicals in workplaces	Michael Yost
Allen,Ryan	Rotating – topic not selected	Sally Liu
Astrakianakis,George	Rotating – topic not selected	Noah Seixas
Crampton,Robert	OP-FTIR methods for gas sampling and identification	Michael Yost
Martin,Marie	Breath monitoring of solvents	Mike Morgan
Carter,Stephanie	Short term exposures to HF and So2 in pot room workers	Noah Seixas
Tsai,Ming-yi	Optical sensing of aerosols using LIDAR	Michael Yost

Current and Past Training:

Academic Training

The following table shows the current and past activity of the training program during the project period. Most MS students complete degrees within 2 years, while Ph.D students typically require 4 to 5 years to reach a degree. MS students graduated from the program during the 5-year project period are listed in Appendix C.

ERC 5 year summary - IH program

In the one year reporting period ending:	08/31/97	08/31/98	08/31/1999	08/31/2000	08/31/2001
ERC supported MS students	6	6	7	6	5
ERC supported PhD students	1	2	1	2	2
All MS students enrolled in 2-yr program	14	11	13	14	14
All PhD students enrolled in program	4	6	7	7	9
All MS students graduated in prior year	11	3	4	5	5
All PhD students graduated in prior year	0	1	0	1	0

Research Training

Since granting the first Ph.D. in the IH training program in December of 1994, five Ph.D. students have graduated under the guidance of faculty in the training program. These research trainees are likely to contribute to the regional expertise and have conducted well-balanced original research contributing to IH knowledge. The principal faculty also have increased the level of research funding available for the support of research trainees, which is highlighted by the diverse list of research funding presented in section (v) above. Major research grants provide support for both MS and Ph.D. student projects; indeed, it is a the policy of the IH program faculty that every research grant application submitted should routinely include a request for financial support for at least one graduate student in the program.

Progress Report July 1, 2000- June 30, 2001

There are presently ten doctoral students enrolled in the Ph.D. program, nine continuing MS students, and 4 new admissions to the program for a total of 23 resident students. Current enrollment has fallen somewhat in the past year (below our target of 6 to 8 new MS students per year), although we continue to review applicants and may admit more in this year. A number of students received recognition through honors and awards as follows: **Stephanie Carter**, PhD student, Stockhausen scholarship, 2000; **Ed Doran,** PhD student, DEH outstanding graduate student, 2000, EPA Star Fellowahip. **Katia Harb,** MS student, scholarship from the Pacific Northwest Section of the American Industrial Hygiene Association, 2000; **Robert Leo**, MS student, Stockhausen scholarship, 2000; **Carolyn Whitaker**, MS student, Stockhausen scholarship, 2000 Best Presentation or Poster by a Student, AIHCE 2001; **Kyung Ehi Zoh,,** MS student, scholarship from the Pacific Northwest Section of the American Industrial Hygiene Association, 2000.

Student Enrollment: Presently there are seventeen students currently enrolled in the MS program in IH. Nine have finished their first academic year and will be returning as second-year students in the Fall. Eight more are within one quarter of completing the degree requirements and are expected to graduate in June or August of 2001. Current students are listed below along with students expected to enroll in the Fall term.

IH program MS students		
Name	**Year entered**	**Preceptor**
Eng, Milton	2000	Daniell
Frick, Gregory	2001	Morgan
Harb, Katia	2001	Seixas
Hyman, Connie	1999(part time until fall 2001)	Yost

Irby, Nicole	2001	Seixas
Leo, Robert	2000	Daniell
Majar, Maria	2000	Seixas
Mata, Carlos	2001	Fenske
Olson, John	2001	Daniell
Ratican, Dan	2001	Morgan
Siapush, Hossein	2000	Kaufman
Whitaker, Carolyn	2000	Seixas
Zho, Kyun-Eih	2001	Yost
Entering Students 2001-02		**Degree**
Wayne Turnberg	2001	Ph.D.
Anca Bejan	2001	M.S.
Fabiola Estrada	2001	M.S.
Leah Mickelson	2001	M.S.

Overall the training program continues to produce strong graduates and to fill a steady regional demand for trained occupational health and safety professionals. We have recently started to have interviews with graduates and made increased efforts to assess the regional changes in professional needs through contacts with industry, and the local AIHA regional section. These contacts suggest that the basic structure of the program is sound, and still allows flexibility in training professionals. Employers in particular seem interested in graduates having a variety of training experiences and general knowledge of both IH, Safety, and environmental issues. Future emphasis in the program will need to focus on integrating these diverse needs, while still maintaining a core of IH training.

OCCUPATIONAL HEALTH NURSING

Student Theses and Project Papers

The following are examples of theses and scholarly projects that have been completed by OHN students over the last five years:

Theses, projects, and dissertations:

Rebecca Schirle, 2001, Barriers to access and utilization of health services by blind workers
Harry Foster Smith, 2001, Barriers to the use of eye protection among Hispanic farmworkers
Thanapun Junyasiri, 2001, Descriptive study of characteristics of workers who experience health symptoms when wearing respiratory protective equipment.
Paul Kennedy, 2000, Perceptions of occupational risk among Russian immigrant physicians and nurses
Bill O'Neill, 2000, Affect of spirituality of health outcomes
Catherine Connon, 1999, Pesticide exposure among children of agricultural workers
Joseph Yandow, 1999, Stress of men who are single parents
Judy Stein, 1999, Development of an anti-violence program
John Furman, 1999, Development of an occupational information management system
Betty Kelman, 1999, Evaluation of a comprehensive occupational program in a high tech industry
Gwendalyn Thompson, 1999, Implementation of an employee assistance program in a Pacific northwest hospital: a descriptive study
Ernest Campany, 1999, Pressures generated by nurses during simulated wound irrigation

Jennifer Sofie, 1999, Creating a successful occupational health and safety program: using workers' perceptions
Judith Bacungan, 1998, Occupational experiences of immigrant Filipino housekeepers
Tiffany Anderson, 1998, An evaluation of nurse practitioners' knowledge about occupational health and safety
Annie Bruck, 1998, Health Fair for a Special Population: Case Example Implemented for the Lighthouse for the Blind
Mary Blanchard, 1998, Hearing protection education for construction workers
Barbara King, 1998, An evaluation of health promotion activities among small businesses
Gayle Reed, 1997, An evaluation of employers perceptions about case management
Colleen Karvonen, 1997, Development of an instrument to detect latex sensitivity among hospital workers
Karen Gough, 1997, Descriptive study of women's perceptions about returning to work following the birth of their first child
Mary Dirksen, 1997, Beliefs about occupational risks among seasonal farmworkers
Linda Blevins - 1997, Latex Allergies among High Tech Workers: Development of an Educational Program
Gayle Reed, 1997. An evaluation of employers' perceptions about case management
Colleen Karvonen, 1997 - Development of an instrument to latex sensitivity among hospital workers.
Michelle Kom, 1997, Using a diary to assess ergonomic problems in workers
Judy Casler, 1996 - Stress and shiftwork among nurses
Barbara Runyon, 1996 - Development of a manual for occupational skin disorders.

Student publications can be found in Appendix H.

Current and Past Training Record

There are currently three PhD in Nursing Science students participating in the OHN program. Sally O'Neill, PhC, MN, expects to complete her program Summer Quarter, 2002. Ms. O'Neill is interested in gender, class, ethnicity, and culture as it relates to the work environment. She also is a union activist and is committed to working with unions to assure worker health and safety. Her research focuses on the occupational hazards, including occupational stresses, which affect women in the police force. Dr. Marcia Killien is serving as Ms. O'Neill's dissertation Chair. Ms. Betsy Gilbert is completing the second year of her program. Her focus is psychosocial factors that affect occupational health and safety. Dr. Salazar serves as her Chair. Mr. Joseph Yandow is interested in the relationship of substance abuse to occupational health and safety. Although he has not yet formed his committee, Dr Salazar is serving as his academic advisor.

The occupational health nursing program faculty continually seek opportunities for the growth and development of our program. A particular focus is the creation of opportunities for increased interdisciplinary interaction among both students and faculty. We feel we have made great strides during the past five years. Although we feel that our interdisciplinary activities have historically been quite good, our search for new opportunities has been fruitful. During this recent period, Dr. Joel Kaufman worked with OHN faculty to develop the six quarter occupational and environmental health seminar series. This has been overwhelmingly successful. The OHN students are required to participate in a minimal of two of the series, preferably in Winter Quarter when it has a more interdisciplinary focus. However, several students have participated in other quarters as well. This course especially lends itself to interaction among the disciplines since it is designed to foster active discussion and debate about issues and cases among the various disciplines. The other major

achievement is the development of a two new clinical sites for the OHN students, one at the Occupational Medicine Clinic and one at Prezant and Associates, a private consulting firm, providing a link between occupational health nursing and industrial hygiene, safety and environmental consulting. Ms. Lillian Sjong, the OHN at the Occupational Medicine Clinic, and Ms. Rosalind Ball, from Prezant have been appointed as members of the OHN Clinical Faculty.

A total of 121 students have completed the requirements for the occupational health nursing program since its inception in 1978. Of these, 117 completed the requirements for a Master's degree, and 4 completed the requirements for the PhD in Nursing Science degree. Over the past five years (since July 1, 1997), a total of 40 students have been enrolled in the occupational health nursing program. This includes 35 Master's level trainees and 5 PhD trainees. Of these, 34 were supported by NIOSH. A total of 25 OHN students have completed all of the degree requirements (24 Master's degrees and 1 PhD degree) during this period.

OHN faculty continue to work closely with other school of nursing faculty to assure occupational health and safety content within the school of nursing. Ms. Gochnour regularly serves as a guest speaker in the undergraduate community health nursing classes. Dr. Salazar provides lectures in various graduate courses such as the doctoral students' role transition course and the nurse practitioner students' assessment course. She also assists non-OHN students to develop projects and research in occupational health and safety. For example, this past year she served as a committee member on a community health nursing students' study of migrant farmworkers perceptions about pesticide exposures, and a nurse practitioners project related to the development of a back injury video for nurses.

Progress Report for the Current Period

A total of 15 students were enrolled in the OHN program this past year; this includes 13 MN students and two PhD students. Two of the Master's level students were occupational health nurse practitioners; the others were in the administration/management pathway. Four of these completed their program of studies in 2001; an additional 7 are expected to complete their requirements in 2002. A complete list of all NIOSH-supported trainees who have completed the program during the current grant period can be found in Appendix C

Students and faculty had several achievements this past year. For example, Diane Anderson was the recipient of the American Board for Occupational Health Nurses' Research Award. Ms. Anderson also completed an 8-week OSHA internship this past year. Betsy Gilbert and Stephanie Rowan were recipients of the Citizens of the World Award. Both will spend 3 weeks in Chiang Mai, Thailand examining occupational health and safety issues during the summer. International relationships are and continue to be a major focus of our program. This past year, Dr. Salazar mentored an international student and served as a sponsor for two international faculty, one from Thailand and one from Korea. She assisted these faculty to develop OHN courses and curriculum to be used in their respective universities. Last summer (2001), Dr. Salazar will spend three weeks at Chiang Mai University in Thailand and a few days at the University of Burapha, teaching OHN courses and consulting with faculty about occupational health and safety issues.

OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

Student publications/theses

Resident's names and respective thesis projects for the last four years are listed below. The table also shows the faculty grant and funding source that provided support or data for the project. A listing of publications is located in appendix H.

NAME	THESIS TITLE	Grant Support (PI)
Ulrike Luderer, MD, PhD, MPH (1998)	Reproductive endocrine effects of acute, controlled toluene exposure in men and women	UW Center for Ecogenetics NIEHS (Dr. David Eaton)
David Suchard, MD, MPH (1998)	Heart rate variability in farm workers exposed to organophosphate pesticides	Neurological Effects of Organophosphate Phosphate pesticides, NIOSH (Dr Keifer)
David Canton, DO, MPH (1999)	An analysis of United States Coast Guard aviation mishaps 1993 - 1998 for potential risk factors	Dr Canton received support from the US Coast Guard for this project
Sanders Chai, MD, MPH (1999)	Perceptions on pediatric environmental health: a needs assessment survey questionnaire	Pediatric Environmental Health Specialty Unit NIOSH (Dr. Brodkin)
Arnold Bunyaviroch, MD, MPH (1999)	A systematic evaluation of methods for evaluating hearing impairment	Former Hanford Worker NIOSH (Drs. Barnhart and Takaro)
David Bonauto, MD, MPH (2000)	A telephone survey of work and injuries in teenage agricultural in an eastern Washington community	Pacific Northwest Agricultural Center NIOSH (Dr. Keifer)
Jiho Huang, MD, MPH (2000)	Emergency department visits for childhood asthma and proximity of residence to vehicular traffic	Pediatric Environmental Health Specialty Unit NIOSH (Dr. Brodkin)
Jordan Firestone, MD, PhD, MPH (2001)	Occupational and environmental risk factors for Parkinson's Disease	Neurological Effect of Parkinson's Disease NIEHS (Drs. Checkoway and Firestone) (K23 award NIEHS)
Gabrielle Morris, MD, MPH (2001)	Decompression illness in children: a comparison of children and adults	Dr. Morris is working with data donated from Mariners Hospital, Hyperbaric

		Medicine Program Facility.
Nilo Arnaiz, MD, MPH (2001)	Genetic factors in the development of an asthma-like condition while employed in an aluminum smelter potroom	Peak Exposures in Aluminum Smelting (Drs. Seixas and Kaufman)

Current and Past Training Record

The ERC Training initiative has strengthened the focus of the training program. Previous residents have included Dr. David Bonauto who is now Associate Director, SHARP, Department Labor and Industry. Dr. Jiho Huang is working as an occupational physician at a large local clinic since graduation. Dr. Jordan Firestone, was awarded a five-year NIEHS K-23 award, in his second year of residency and is mentored by Dr. Harvey Checkoway. He has also taken an Acting Instructor appointment in Neurology while completing his occupational medicine board eligibility requirements. He is launching an academic career of research and practice in occupational and environmental neurology.

Over the five-year reporting period from 1997-2002, the program has graduated ten residents. Two have done third-year research years (Luderer, Chai,), one is part of the joint Occupational Medicine/Pulmonary program (Arnaiz), and one has secured his own K-23 award (Firestone). All graduates are currently working in the field of occupational medicine, in either the private and public sectors. Examples include group practice (Bunyaviroch, Huang, Suchard), federal and state government (Bonauto, Canton) and academia (Chai, Luderer, Firestone).

Name	Years In Program	Current Employer
Ulrike Luderer, MD, PhD, MPH	1995-1998	Faculty, University of California, Irvine
David Suchard, MD, MPH	1996-1998	Kaiser-Permanente
David Canton, DO, MPH	1997-1999	U.S. Coast Guard
Sanders Chai, MD, MPH	1997-1999	Faculty, Dept. of Environmental Health, University of Washington
Arnold Bunyaviroch, MD, MPH	1997-1999	Kaiser-Permanente
David Bonauto, MD, MPH	1998-2000	Dept. of Labor & Industry (SHARP), State of Washington
Jiho Huang, MD, MPH	1998-2000	Everett Clinic
Jordan Firestone, MD, PhD, MPH	1999-2001	Faculty, Neurology, University of Washington
Gabrielle Morris, MD, MPH	1999-2001	2nd Year Fellow
Nilo Arnaiz, MD, MPH	1998-2001	3rd Year Joint-Pulmonary/OccMed Fellow

Progress Report

The current project period covers the academic year July 1, 2000 to June 30, 2001. During this project period, five residents are in the Program. Four receive support from the ERC.

Residents graduating in June, 2001 include:

- Nilo Arnaiz, MD (ERC), studying genetic factors associated with asthma in aluminum smelting.
- Gabrielle Morris, MD (ERC), researching decompression illness in children.
- Jordan Firestone, MD, PhD (K-23), researching genetic factors in Parkinson's Disease

A list of the current (continuing and beginning July, 2001) residents and their funding source is as follows:

- Paul Darby, MD, PhD (OPSF) – 2nd Year
- Stacey Newsom, MD (ERC) – 2nd Year
- Donna LaVallie, MD, MPH (ERC) – 1st Year
- Marilyn Nayan, MD (ERC) – 1st Year
- Mikhail Makovski, MD (ERC) – 1st Year

Dr. Arnaiz is a third-year joint Pulmonary/Occupational Medicine Fellow, finishing his second year in the Occupational Medicine Program. After completion of this year, he will return to Pulmonary for a final year, at which time he will have completed the joint program. Upon completion of this project period, he will have completed all the necessary requirements for conferment of the degree of Masters of Public Health (MPH) and will be board eligible for Occupational Medicine and Pulmonary and Critical Care medicine. Dr. Morris is finishing her second year of the Program, and is currently involved in finishing her practicum rotation and thesis research. Her main clinical research interests involve Hyperbaric medicine, which have been facilitated by a practicum month at the local National Oceanic and Atmospheric Administration (NOAA) office, collaboration with the Seattle Police Divers Surveillance Monitoring Program, and thesis research studying decompression illness in children. Dr. Firestone is also finishing his second year of the Program. Between his first and second years, he received a K-23 award from the National Institutes of Health, to study the neurological effects of Parkinson's disease. This will also be a focus of his thesis work.

Drs. Newsom and Darby are both finishing their first year in the Program. The first year is primarily concerned with credit requirements in course work and rotation through the Occupational & Environmental Medicine Clinic at Harborview Medical Center. The summer break offers second-year residents the opportunity to become thoroughly involved in one of a minimum of two practicum rotations. Both Drs. Newsom and Darby will be conducting practicum rotations this summer at Boeing and Weyerhaeuser, respectively. Dr. Darby was awarded an academic scholarship, to commence with the next project period, from the Occupational Physicians Scholarship Fund (OPSF).

There have been no major changes to the curriculum in the current project period. Completion of the MPH degree requires 63 quarter credits. We predict no major changes to the curriculum in the coming year.

The ERC as a funding source contributes immensely to the Program and the need for qualified Occupational Medicine doctors in the region. ERC funding continues to be an essential source of support for the training infrastructure of the Program. Over the current project period, the Training Related Expenses have allowed for valuable research in Hyperbaric medicine, asthma and genetic risk factors for environmental and occupational disease, as well as providing an opportunity for research project presentation at local seminars, workshops and meetings.

OCCUPATIONAL SAFETY

Current and Past Training Record

Graduates

Theresa Lango**, M.S., June 1997. Reduction of musculoskeletal discomfort and mental fatigue in lumber graders: Efficacy of automated board turning, microbreaks, and alternating work activities. Preceptor: Dr. Stephen Wiker. Ms. Lango is a Safety Specialist for the Montana Department of Labor.

Lt. Tommey Meyers, M.S., June 1997. His research was conducted in collaboration with the US Coast Guard, and was entitled "Human fatigue at US Coast Guard motor lifeboat stations. Preceptor: Dr. Stephen Wiker. Lt. Meyers continues on active duty with the Coast Guard.

Astrid B. Schreuder**, M.S.I.E., August 1998. Thesis title, "Reduction of Vigilance Decrement in Lumber Graders." Preceptor: Dr. Scott C. Iverson. Ms Schreuder is currently pursuing her PhD in Industrial Engineering at the University of Washington.

Kyle Ren**, M.S., June 1999. His thesis topic was "Quantitative Estimation of Frequency and Intensity of Exposure to Injury Risks in Construction." Preceptor: Dr. Noah Seixas. Mr. Ren is an Industrial Hygienist with Kaiser Corporation.

Peregrin Spielholz, Ph.D., June 1999. A Comparison of Physical Stress Exposure Assessment Methods in Tree Nursery Work: Measurements for the Upper Extremities. Dr. Michael Morgan served as his advisor, and his dissertation supervisory committee included Drs. Harvey Checkoway and Joel Kaufman of the Department of Environmental Health, Dr. Barbara Silverstein of the State Department of Labor and Industries, and Dr. Beverly Horn of the School of Nursing. Dr. Spielholz now works as a researcher for the Washington State Department of Labor and Industries, Olympia, WA.

Barbara Faville**, M.S., August 2000. Validation of Five Checklists Used to Assess Risk Factors Associated with Musculoskeletal Disorders of the Upper Extremities. Preceptor: Michael Morgan. Ms Faville is a Senior Ergonomist with the Clayton Services Group in Seattle Washington.

Claire A. Olsovsky**, M.S., June 2000. An electromagnetic field exposure assessment of airline ground crew workers: A comparison of metrics. Preceptor: Steven Guffey.

Alex H. Kazmierczak**, M.S.I.E., June 1999. Assembly Line Ergonomic Hazard Evaluation. Preceptor: Dr. Steven Wiker.

** NIOSH ERC Safety Trainees

Progress Report, July 1, 2000 to June 30, 2001:

Graduates

A listing of trainees who completed the MS degree requirements during the reporting period is given below, including date of completion, thesis title and faculty supervisor.

Lori Winnemuller** MS June 2001. Reliability and validity of supervisor assessment of ergonomic risks. Preceptor: Dr. Joel Kaufman. Ms Winnemuller's thesis project entailed assessing how well supervisors, not formally trained in ergonomics, could identify ergonomic risk hazards using Appendix B in the Washington State Ergonomic Standard. She is spending the summer to travel and will seek employment in the fall.

Current Trainees

Carolyn Salazar** BS, Occupational Therapy and BS, Psychology, University of Washington, 1994. Carolyn is a professional occupational therapist at the Harborview Medical Center in Seattle, is enrolled as a full-time student in the Graduate Program in Occupational Safety and will be doing her summer internship at SHARP in Olympia, Washington.

** NIOSH ERC Safety Trainees

HEALTH SERVICES RESEARCH TRAINING

Program leadership and faculty research qualifications

Thomas Wickizer, Ph.D., M.P.H. continues to direct the training program; Gary Franklin, M.D., M.P.H., serves as Co-Director of the program. Drs. Wickizer and Franklin continue to actively collaborate on occupational health services research projects. One of the important projects on which they are currently collaborating is the Washington State Occupational Health Services (OHS) Project. This is a major research and demonstration project designed to improve the quality of health care delivered to injured workers through the Washington State workers' compensation program. The implementation phase of the OHS project began in January 2002. It is anticipated that by June 2002 as many as 300 community physicians in the Seattle area will be participating in the project, providing occupational health care services based upon explicit performance indicators. Drs. Wickizer and Franklin will conduct a major multi-year evaluation of this project, which would afford trainees excellent research training opportunities. Other ongoing research projects conducted by Drs. Wickizer and Franklin also offer doctoral trainees and post-doctoral fellows excellent research training opportunities.

The program's core faculty has been reduced slightly because of the smaller than anticipated program enrollment. Dr. Matt Kiefer, Associate Professor, is no longer listed as a core faculty member. Other core faculty will remain the same during the coming budget year. Health Services core faculty include Dr. Diane Martin, Professor and Director of the Health Services Research Doctoral Program within the Department of Health Services, and Dr. Branko Kopjar, M.D., Ph.D., Associate Professor. Core faculty from the Department of Environmental Health include Michael Morgan, Sc.D., Professor and

Director of the University of Washington ERC, and Joel Kaufman, M.D., M.P.H., Associate Professor. Dr. Mary Salazar, Director of the Occupational Health Nursing Program, also serves as a core faculty member for the training program.

Program Plan

Significant need continues to exist for health services researchers with specialized training in occupational health. Other than the three NIOSH-funded training programs at Washington, Minnesota and North Carolina, to our knowledge no programs currently exist that provide Ph.D. training in occupational health services research. However, each of the NIOSH-funded training programs has experienced challenges in recruiting qualified trainees. The reasons for this are not entirely clear. Occupational health services research is a new and evolving research area. Prospective trainees may not fully appreciate the long-term career opportunities that this field presents. Further, the demand for health services research training among individuals with backgrounds in industrial hygiene and related fields appears to be more difficult to identify than initially assumed. For these and other reasons, recruiting trainees has been an ongoing challenge.

It should also be noted that the NIOSH training programs are less than two years old. It simply may take longer than anticipated to conduct the necessary marketing and recruiting activities needed to identify a qualified applicant pool. We plan to continue our marketing efforts, which include advertising at major health services research conferences and advertising in the print media, and to demonstrate through our active research program how occupational health services research can play a leading role in informing health policy. For example, Dr. Wickizer is completing an evaluation of a drug-free workplace program established by Washington State to reduce occupational injuries. This evaluation represents the most comprehensive study to date of a drug-free workplace program. Dr. Wickizer will be presenting the results of this study at the upcoming annual health services research conference in Washington D.C. in June. Acceptance of abstracts for oral presentations at this conference is exceedingly competitive, with fewer than 10% of the submitted abstracts selected. This clearly demonstrates that findings of well designed occupational health services research studies do have perceived relevance and importance for the broader field of health policy and health services research. Dr. Wickizer is also currently completing three papers reporting the results of this evaluation that will be submitted to highly regarded health services research journals. In addition, Dr. Wickizer has two pending grants for occupational health services research currently under review at the Robert Wood Johnson Foundation. This research, if funded, should lead to at least ten publications in major health services research journals and in clinical journals. As the field of occupational health services research matures and evolves, there is every reason to believe that NIOSH's current efforts to support the training of health services researchers will yield important dividends.

Research Training

The training program offers doctoral-degree trainees and post-doctoral fellows a range of options and opportunities for involvement in health services research projects, both within the university and through field-based studies in external organizations. As discussed earlier, current research being conducted by Drs. Wickizer and Franklin, and by other core faculty affiliated with the ERC and the Department of Health Services, affords trainees and fellows excellent opportunities for involvement in important research activities. Each trainee and fellow is expected to select some research activity or project that they undertake under the guidance of a program faculty. Trainees and fellows will be strongly encouraged to write up the results of their research in peer reviewed publications.

The program's current doctoral-degree trainee, Mr. Bert Stover, has worked with Dr. William Daniell, Associate Professor, on research involving hearing loss. Currently, Mr. Stover is considering options for dissertation research that may allow him to pursue his interest in investigating the effects of workplace culture on the use of protective personal equipment.

Training Candidates

At this time, the program has one doctoral-degree trainee. We originally anticipated admitting two doctoral-degree trainees and a post-doctoral fellow during the 02 grant year (admission for fall 2001). This proved unsuccessful. We hope to admit three doctoral-degree trainees and a post-doctoral fellow during the 03 grant year (admission for fall 2002).

As discussed earlier, we will continue our active marketing and recruitment efforts. Dr. Wickizer will market the program during the upcoming annual health services research conference, as well as at the November annual meeting of the American Public Health Association in Philadelphia. In addition, the program will continue to recruit trainees and fellows among students and physician residents at the University of Washington.

Facilities and Resources

The facilities and resources of the program have remained unchanged. The training program continues to utilize the resources of the University of Washington, including classrooms, the extensive health sciences library system, and the university's academic computing center. The training program is based off campus at the Occupational Epidemiology and Health Outcomes Program. Unfortunately, the university suffers from a chronic shortage of space, and it was not possible to locate the program training office within the health sciences complex. Trainees are able to take advantage of resources provided through the Occupational Epidemiology and Health Outcomes Program as well as other resources made available through the ERC and its affiliated programs.

HAZARDOUS SUBSTANCE ACADEMIC TRAINING

Progress Report

Graduates:

Cynthia Curl, M.S., August, 2000. Organophosphorous Pesticide Exposure in Children of Agricultural Families in the Lower Yakima Valley. Preceptor: Richard Fenske.

Rene Showlund. June, 2001. Exploratory study to investigate the distribution of pesticide residues on skin following contact with contaminated surfaces. Preceptor: Dr. John Kissel.

Jeffrey Stewart. August, 2001 JEvaluation of occupational exposure to biological hazards at waste water treatment plants in Washington State. Preceptor: Dr. Mansour Samadpour of the Environmental Health Technology Program of DEH.

One student entered the program for the autumn quarter of 2000:

Ryan Allen. BS, Physics, Denison University, 1998; MS, Environmental Engineering, UW, 00. Ryan is interested in air quality modeling and optical remote sensing of air contaminants released from hazardous waste sites. He will be pursuing a PhD in Environmental Health, under the curriculum of the Industrial Hygiene Program.

In addition, there are several students pursuing thesis research in the area of hazardous substance exposure at waste sites, who would qualify for support under this program if additional funding were available. Since the regular Industrial Hygiene & Safety program provides support for thesis support in the second year, we are requesting funds for thesis research supplies in support the two trainees listed above and one additional trainee, who would be selected on the basis of scholastic performance and commitment to a career in hazardous substance management.

Collaboration with State and Federal Agencies

The Department has an active research program in hazardous waste. It is one of nine institutions awarded a Program Project research grant to study toxic effects of waste chemicals under the NIEHS Superfund basic research program. The Department has also conducted research and assessed health risks at active and inactive waste sites, including Gas Works Park, the Kent Highlands Landfill, the ASARCO Smelter and the Midway Landfill. Internships for HSAT students are available with the State Department of Ecology, USEPA Region 10 office, and the US Department of Energy at the Hanford Nuclear Reservation.

Outreach activities with State and Federal Agencies during the past 12 months include:

Washington Department of Labor and Industries worker training courses (G. Franklin, Occpational & Environmental Medicine Program, M.E. Flanagan, Industrial Hygiene & Safety Program, R. Gleason);
Quarterly meeting (D. Kalman, J. Camp)
Oregon State University Chemical Applicators Training Course (R. Fenske presentation)
Howard Hughes Medical Institute, project on managing hazardous wastes in academic institutions (R. Hahne, Industrial Hygiene & Safety Program)
Occupational Medicine Clinic for Yakima Valley Farm Workers (M. Keifer, Occupational & Environmental Medicine Program)
ATSDR, States Meeting on Bioavailability of Contaminants (J. Kissel)
EPA FIFRA Advisory Panel (J. Kissel)
State Dept. of Ecology, Joint Committee on Monitoring of Air Toxics (J. Koenig, S. Liu)
US Dept of Energy, Amchitka AK test site surveillance program (T. Takaro, Occupational & Environmental Medicine Program)

HAZARDOUS SUBSTANCE TRAINING

Coordination with Agencies

Because an important audience for the NIOSH-funded hazardous substance courses is federal, state, and local health and environmental agency personnel, close coordination with those agencies is essential. This interaction is assured through an advisory committee comprised of representatives of

key agencies. The following is a list of individuals who have served on the Hazardous Substance Advisory Committee during the 1997-2002 grant period:

Nir Barnea, National Oceanic and Atmospheric Administration, Seattle
Enrico Baroga, Washington Department of Transportation, Olympia
Jeff Burgess, MD, Department of Medicine, University of Washington, Seattle
John Butler, Washington Department of Ecology, Olympia
Joseph Ciarlo, Clallam County Road Department, Port Angeles
Neil Clement, Local Emergency Planning Committee, Bellingham
Mac Davis, MSPH, Washington Department of Labor and Industries, Seattle
Mary Evans, National Oceanic and Atmospheric Administration, Seattle
Chris Field, U.S. Environmental Protection Agency, Seattle
Dean Ikeda, MS, CIH, U.S. Occupational Safety and Health Administration, Bellevue
Dave Kalman, PhD, Department of Environmental Health, University of Washington, Seattle
Larry Kirchner, Seattle-King County Department of Public Health, Seattle
Joe Loera, MD, Emergency Medicine, Kennewick General Hospital, Kennewick
R. Scott MacKay, MEd, Department of Environmental Health, University of Washington, Seattle
Thomas Martin, MD, MPH, Medical Toxicology Program, University of Washington, Seattle
Sharon L. Morris, Department of Environmental Health, University of Washington, Seattle
Adrienne L. Norquist, Department of Environmental Health, University of Washington, Seattle
Chief Carl Osaki, Seattle-King County Department of Public Health, Seattle
Lieutenant Jim Peschel, U.S. Coast Guard, Seattle
Doug Pierce, Washington Department of Transportation, Olympia
Janine Rees, Washington Department of Labor and Industries, Seattle
Jeff Rodin, Region X U.S. Environmental Protection Agency, Seattle
John R. Scheer, Franklin County Emergency Management, Pasco
Julie D. Schmitz, Department of Environmental Health, University of Washington, Seattle
Jan Schwert, Department of Environmental Health, University of Washington, Seattle
Karen Stout-Abariotes, CIH, Washington Department of Labor and Industries, Spokane
Lieutenant Andrew Tucci, U.S. Coast Guard, Seattle

Advisory Committee members from the EPA, OSHA, NOAA, and the Coast Guard are in a position to advise of regional and state needs. Committee members have continued to stay directly involved as courses have been developed and presented. A subgroup of the Advisory Committee is actively involved in the development and teaching of the Hazardous Materials Incidents: Improving Interagency Response course.

Summary of Courses Offered

Since 1988, when the Northwest Center for Occupational Health and Safety first offered training under this grant program, hazardous substance courses have been made available to employees of federal, state, and local government agencies in Washington, Oregon, and Alaska. Four of these courses, Hazardous Waste Annual Refresher, Supervising Hazardous Waste Operations, Hazardous Materials Transportation, and Confined Spaces, are required by federal and state regulations. The Hazardous Materials Incidents: Improving Interagency Response course is a unique program focusing on the need for coordination with other agencies during a hazardous materials incident.

In 1997-2002, 1,238 people were trained in these courses, including 446 environmental health professionals, 174 safety professionals, 93 industrial hygienists, 32 physicians, 20 nurses, more than 20 engineers, and over 100 worker representatives. Eighty percent of participants came from federal, state, and local government agencies (a primary target audience). Courses were held throughout the state of Washington.

Since Washington has the majority of the EPA national priorities list's hazardous waste sites (47) in the region, as well as more than half of the nearly 10 million regional population, there is a greater need for training in this state. Washington is also centrally located, with courses in eastern Washington serving Idaho and courses in southern Washington accessible to Oregon. Oregon has 10 sites and about 3 million people, Idaho has 6 sites and approximately 1 million people, and Alaska has 7 sites and just over a half million people.

Program Evaluation

Program evaluation and quality control are assured through the active participation of DEH faculty, oversight by the Hazardous Substance Training Advisory Committee, and careful review of participant comments. Dr. David Kalman serves as the faculty technical advisor for the courses. The curriculum for each course is developed by the program director, course director, and faculty, with the assistance of the Advisory Committee. Members of the Advisory Committee review course curricula and attend and evaluate each course. Continuing education credits are obtained from appropriate professional associations.

The Hazardous Materials Incidents: Improving Interagency Response course has consistently received excellent evaluations from attendees. It is a unique program that brings together representatives from the key federal, state, and local agencies involved in responding to hazardous material incidents and provides them with a better understanding of the roles of other agencies as well as resources available to them. Participants also leave the course with a better appreciation of the need for adequate protection of workers involved in incident response. The course has been presented around the state, with assistance from local officials, and a new role-playing scenario is developed each time, appropriate to the region where the course is being held. As students participate in role-playing the scenario, they must put into practice all they have learned during the previous two days. This gives the faculty and advisory committee members an excellent opportunity to observe how much the students have learned. During the debriefing session afterwards, participants evaluate their own performance.

The Hazardous Waste Refresher and Supervising Hazardous Waste Operations courses are built around case studies in which students actively participate by solving problems. The Sampling for Hazardous Materials and the Safety & Health Issues in Confined Spaces courses give students the opportunity to learn via hands-on sampling exercises. The interactive nature of these courses assures that the students are able to demonstrate their knowledge of the basic concepts being presented.

Progress Report, July 1, 2000 - June 30, 2001

The needs assessment form was sent to approximately 200 key people in the region. Students provided input through filling out the course evaluation forms distributed in each class. The general public submitted ideas through filling out the needs assessment section on the website.

Both the Hazardous Substance Training Advisory Committee and the Northwest Center for Occupational Health and Safety Advisory Committee met multiple times this past year and provided input. A focus group consisting of occupational health nurses, occupational health physicians, and industrial hygienists met during the Northwest Occupational Health in Bellingham, Washington.

Results from course participant evaluations, website and other needs assessments, and input from advisory boards and focus groups were tabulated and reviewed by the DEH Outreach Committee. Any responses pertaining to hazardous substances training were considered in developing courses for the coming year. The Outreach Committee combined survey results with the factors discussed below and decided on a semi-final list to be considered by departmental faculty; the committee and the continuing education staff then chose a final list.

The Director of the Program is Scott MacKay. As Director of Continuing Education for the Department of Environmental Health, Mr. MacKay is responsible for presenting more than 20 short courses and conferences a year on a variety of occupational safety and health and public health topics, as well as 35 more under the OSHA Training Institute Education Center program. Mr. MacKay has his Master's Degree in Adult Education from Brigham Young University and comes to the Department of Environmental Health Continuing Education Program having served 10 years as the Director of the Center for Training and Development at California State University, Dominguez Hills. Mr. MacKay reports to Ms. Sharon Morris, Senior Lecturer and Assistant Chair for Community Outreach in the Department of Environmental Health who plays an active role in the activities of the Continuing Education Program.

Because an important audience for the NIOSH-funded hazardous substance courses is federal, state and local health and environmental agency personnel, close coordination with those agencies is essential. This interaction is assured through an advisory committee comprised of representatives of key agencies. The following is a list of 2000-2001 Hazardous Substance Training Advisory Committee members.

Enrico Baroga, Washington Department of Transportation, Olympia
John Butler, Washington Department of Ecology, Olympia
Mac Davis, MSPH, Washington Department of Labor and Industries, Seattle
Mary Evans, National Oceanic and Atmospheric Administration, Seattle
Dean Ikeda, MS, CIH, U.S. Occupational Safety and Health Administration, Bellevue
Dave Kalman, PhD, Department of Environmental Health, University of Washington, Seattle
Larry Kirchner, Seattle-King County Department of Public Health, Seattle
R. Scott MacKay, MEd, Department of Environmental Health, University of Washington, Seattle
Thomas Martin, MD, MPH, Medical Toxicology Program, University of Washington, Seattle
Sharon L. Morris, Department of Environmental Health, University of Washington, Seattle
Adrienne L. Norquist, Department of Environmental Health, University of Washington, Seattle
Doug Pierce, Washington Department of Transportation, Olympia
Jeff Rodin, Region X U.S. Environmental Protection Agency, Seattle
Julie D. Schmitz, Department of Environmental Health, University of Washington, Seattle
Karen Stout-Abariotes, CIH, Washington Department of Labor and Industries, Spokane
Lieutenant Andrew Tucci, U.S. Coast Guard, Seattle

Summary of Courses

In 2000-2001, 180 people were trained, including 71 environmental health professionals, 27 safety professionals, 34 worker representatives, and 21 industrial hygienists. Ninety-one percent of participants come from federal, state, and local government agencies (a primary target audience). Courses were held throughout the state of Washington in Seattle, Everett, and Port Angeles.

On March 1, 2001, The Department of Environmental Health Continuing Education Program launched an innovative public/private agreement with Advance OnLine Inc., an online training provider of safety and health training. Online courses go through the same rigorous preparation and evaluation process as the traditional classroom program.

The following were the courses taught from July 1, 2000 - to June 30, 2001:

Date	Course	No. Trained
7/24-25/00	Safety & Health Issues in Confined Spaces (Seattle)	4
7/26/00	Hazardous Waste Annual Refresher (Seattle)	27
7/27/00	Hazardous Materials Transportation (Seattle)	7
9/19-21/00	Hazardous Materials Incidents: Improving Interagency Response (Port Angeles)	26
11/27/00	Confined Space Entry Training (Seattle)	22
1/24/01	Hazardous Waste Annual Refresher (Seattle)	31
1/25/01	Hazardous Waste Annual Refresher (Seattle)	29
1/26/01	Hazardous Waste Annual Refresher (Seattle)	27
Online	Hazard Communication	1
Online	Hazardous Waste Annual Refresher	2
Online	Permit-Required Confined Spaces	3
Online	Spill Prevention Control and Countermeasures (SPCC)	1

Safety & Health Issues in Confined Spaces
Training for environmental professionals and other workers who are required to enter confined spaces. Aimed at protecting workers from toxic and other hazards associated with working in confined spaces.

Hazardous Waste Annual Refresher (both classroom and web-based courses)
The annual refresher uses lectures, group exercises, and a case study to provide students with the eight hours of annual training required for all employees involved in hazardous waste operations.

Hazardous Materials Transportation
Federally mandated training for those who work with hazardous materials or in hazardous waste transportation.

Hazardous Materials Incidents: Improving Interagency Response
Participants learn how to work with other agencies when responding to a hazardous materials incident. The course includes practice using the incident command system with their counterparts in Washington agencies and fulfills OSHA/WISHA requirements for hazardous waste or emergency-response refresher training.

Confined Space Entry Training
This was a contract course held for the United States Coast Guard. The course covered the types of confined spaces, permit vs. non-permit vs. alternate entry, written permit, atmospheric monitoring, ventilation, emergency rescue, respiratory protection, attendant, entrant, and supervisor duties.

Hazard Communication (online)
A one hour asynchronous, self-paced web-based course giving general training regarding chemical hazards

Permit-Required Confined Spaces (online)
A one hour asynchronous, web-based course discussing safety measures for permit-required confined spaces. OSHA training, duties and responsibilities, and personal protection.

Spill Preventon Control and Countermeasures (online)
A three hour, asynchronous web-based course detailing oil spill responsibilities in 40 CFR Parts 112.1 to 112.7. Training for operators and facility supervisors. Prevention and containment of oil spills and SPCC plan.

CONTINUING EDUCATION AND OUTREACH

Continuing Education for Each Program Area

Faculty Commitment/Breath/ Faculty Reputation/Strength

The faculty who teach in the CE program include leaders in the field of occupational safety and health within the Pacific Northwest, throughout the United States, and internationally.

During the past five years, regular faculty, staff, and students from most programs in the Department of Environmental Health have taught or served on course committees in the Continuing Education program. In addition, several of the Department's adjunct, clinical and affiliate faculty members have taught in Continuing Education courses. Faculty in the School of Nursing have participated in CE courses as well as faculty, fellows, and staff from the Occupational and Environmental Medicine program. In addition, numerous faculty presenters came from other Departments at the University of Washington as well as other schools and universities. In addition to academia, many speakers came from government agencies, private industry, labor unions, and professional and trade associations.

Program Leadership and Faculty

From 1982 - 2000 the Program Director was Ms. Sharon Morris, Senior Lecturer and Assistant Chair for Community Outreach in the Department of Environmental Health. Ms. Morris, who continues as Assistant Chair for Community Outreach in the Department, has played a major role in the Northwest Center's continuing education program for nineteen years. She continues to work with the new Program Director, Scott MacKay, in building a high quality program. Ms. Morris is a member of the University of Washington's Continuing Education Board of Directors and has been a member of the NIOSH Review Panel for Hazardous Substance Training and the NIEHS Ad Hoc Hazardous Waste Training Review Committee.

In March of 1999, Mr. Scott MacKay became manager of the continuing education program, replacing Ms. Jan Schwert who left the department for another assignment within the University. Mr. MacKay has a Master's Degree in Adult and Continuing Education from Brigham Young University. In 2000 Mr. MacKay assumed the Program Director position formerly held by Sharon Morris. He also serves as the Director of the OSHA Region X Training Institute Education Center and as Director of the Department of Environmental Health's Continuing Education Program. Assisting Mr. MacKay in developing high quality programming is Ms. Julie Schmitz, Program Support Supervisor. Ms. Schmitz has her Bachelor's Degree in French from Western Washington University and has worked in the CE program since 1993 in ever increasing areas of responsibility.

Policy guidance is provided by Michael Morgan, ERC Director, and two advisory committees. The Outreach Committee, a standing committee in the Department of Environmental Health, provides valuable policy guidance and assistance in selecting courses to be presented. The ERC Advisory Committee, which also provides guidance to the CE program, is described elsewhere in this proposal. In addition, almost all of the individual courses have their own planning committees composed of faculty from the Northwest Center, other course presenters, and representatives from affected groups.

The commitment of Departmental faculty to Continuing Education is impressive. Continuing Education is considered a part of the regular teaching duties of each faculty member, for which they do not receive additional compensation. These excellent faculty are supplemented by national and international experts from other universities, government agencies, private industry, and unions, to make certain the courses present up-to-date information in occupational safety and health from a variety of perspectives.

Courses Offered by Specialty Area

The Northwest Center for Occupational Health and Safety is nationally recognized for the quality and variety of its continuing education programs, which continue to meet regional, national, and international needs. During the last five years, 162 courses were offered to 6,961 participants. **(See table 1 for a complete list of courses.)** Most courses were interdisciplinary in nature, with many physicians, industrial hygienists, nurses, and safety professionals in the audience, which makes it difficult to divide them by specialty area. The courses listed contain a mix of introductory and advanced topics. Following are examples of courses of special interest to each of the four core disciplines.

Examples of courses of special appeal to industrial hygienists included Toxicology for Non-Toxicologists; Non-Ionizing Radiation; Occupational Noise Update; Comprehensive Review of Industrial Hygiene; Effective Worker Training; Occupational Skin Disorders: Management and Prevention; Wood Dust Exposure: The Proposed New Exposure Guideline & How It May Affect the Woodworking Industry; and Assessment of Exposures to Fine Atmospheric Particulate: Challenges and Progress.

Examples of courses for safety and ergonomic professionals included Advances in Ergonomics: Overview of the Science; Farm Health and Safety: A Focus on Prevention; Ergonomics of Occupational Hand-Arm and Whole-Body Vibration; Leadership Skills for Occupational Safety &

Health Professionals; Best Practices in Ergonomics; Legal Aspects of Construction Safety; Improving Safety & Health: Learning from Programs that Work; and Laboratory Safety and Health.

Examples of courses of special interest to occupational health nurses included Overview of Occupational Health Nursing; Return-to-Work Programs: Practical Solutions to Problems; Safe Needles Saves Lives: Learn How to Prevent Needlesticks; and An Aging Workforce: Issues for this Century. An example of a nursing course, which also attracts a national audience is the biennial Conference on Occupational Hazards to Health Care Workers. At this conference many well-known speakers provide comprehensive assessments of chemical, physical, biological and psychosocial risks for workers in diverse health care settings. Occupational exposures to health care workers have received increased attention since the HIV/AIDS and TB epidemics began posing special concerns. Practical information on preventing hazards and developing effective health and safety programs are included in this program. Participants are able to attend workshops on specific topics, where they have opportunities to interact with faculty and other attendees.

Examples of courses of special interest to physicians included Occupational Medicine for Primary Care Physicians; Treatment of Work-Related Musculoskeletal Disorders: Outcomes, Controversies, Consensus; Occupational Asthma: Assessment, Intervention, and Prevention; Occupational Skin Disorders: Management and Prevention; Pesticide Medicine; Environmental Health Issues in Children: What Pediatricians and other Primary Care Providers Need to Know; and Current Controversies in Occupational Medicine.

Courses Offered Using New & Innovative Technologies

Internet

Beginning in 2001, the CE Program began offering twenty-one web-based courses with AdvanceOnline Inc., a private health and safety training vendor. Topics ranged from asbestos hazard protection to storm water pollution prevention. These are short (eight or fewer hours) asynchronous courses taught via the web. Additional courses are being developed. Immediately after the 2001 Seattle earthquake, the CE program, in partnership with AdvanceOnline Inc., offered a free online workshop on earthquake response and preparation.

Video

During 1999/2000 and 2000/2001, a total of four courses were digitally videotaped for distribution to participants and the general public. As part of CE's participation in the Fogerty Grant, these courses will be translated into Spanish, Vietnamese, and Thai and distributed to occupational medicine professionals in Cost Rica, Nicaragua, Viet Nam, and Thailand. In addition, small segments of these programs will be available on the CE website to help promote the CE programs.

Contract and Customized Training

The Center has been expanding the offering of site based, customized training within Region X and nationally. In 2000/2001 the Center was contracted by a private vendor to develop and deliver on-site training throughout the United States. The course, 8-Hour Cell Site Safety Awareness, was delivered 18 times in 9 different locations. As a result of a focus group held in Anchorage, Alaska, with local state and private safety directors, a two-day course in Collateral Safety Duty for non-Federal Supervisors was developed and delivered in Anchorage. Also in Anchorage, employees of the Federal

Aviation Administration participated in a custom-designed Construction Safety and Health Training course. A customized Confined Space course was delivered to Coast Guard members in Bremerton, WA.

Profile of Trainees

During the last five years, 41.36% of attendees worked for federal, state, and local governments; 28.82% worked for service industries, including medical, educational, and legal services; and 14.42% worked for manufacturing industries. The remaining 15.40% worked for a variety of companies, including small businesses and the transportation and communication industries.

Attendees included the four core professions, with 21.46% (1,494) safety professionals, 17.15% (1,194) industrial hygienists, 8.65% (602) nurses, and 7.87% (548) physicians. Administrators, engineers, environmental health professionals, attorneys, physical therapists, and others with some responsibility for occupational safety and health comprised the remaining 44.86% (3,123) of the attendees.

During 1997 - 2002, attendees came from 30 states, the District of Columbia, British Columbia, and Alberta. The majority of attendees came from Region X: 72.48% came from Washington, 11.00% came from Oregon, 3.00% came from Alaska, 1.38% came from Idaho. We have increased the number of courses presented outside the Puget Sound area. We presented courses in Eastern Washington (15), Oregon (7), Alaska (6), Missouri (4), Texas (4), Arizona (2), Florida (2), and New York (2).

NIOSH grant funds and revenue from well attended regular programs help subsidize outreach efforts in less populated areas, such as Alaska, and have enabled us to offer scholarships to attendees whose employers lack training funds, worker representatives, and students. This enables us to provide occupational safety and health training to the broadest possible audience. Department of Environmental Health students who assist with putting courses on can attend for free.

Collaborative and Regional Efforts

The Northwest Center works closely with national and regional associations, agencies, and other educational institutions to offer continuing education courses. A program presented annually at the Northwest Occupational Health Conference is developed by an advisory committee, including representatives of the Northwest Center and the Northwest occupational health nursing, and industrial hygiene associations. Another course is presented annually with the Washington Governor's Industrial Safety and Health Conference.

During the past five years, we have co-sponsored programs with other schools and programs within the University, such as the School of Medicine, the School of Dentistry, the Occupational and Environmental Medicine Program, the NIEHS Center for Ecogenetics and Environmental Health, the Pediatric Environmental Health Specialty Unit, the Center for Child Environmental Risks Research, the Institute for Risk Analysis & Risk Communication, and the Superfund Basic Research Program.

We have also co-sponsored programs with other universities, such as the University of California Berkeley and the University of British Columbia's Occupational and Environmental Hygiene Program.

Additionally, programs have been co-sponsored with non-academic organizations, such as the American Industrial Hygiene Association (Pacific Northwest and Midnight Sun Sections), the Washington State Association of Occupational Health Nurses, OSHA Region X, the American Society for Safety Engineers (Alaska Chapter), and BP Exploration Alaska.

To develop continuing education courses in Alaska, including a collateral duty safety course for Supervisors offered May 2001 in Anchorage, Mr. MacKay has been meeting with the Denali Safety Council, University of Alaska, Anchorage, the Anchorage Chapters of ASSE (American Society of Safety Engineers), and AIHA (American Industrial Hygiene Association).

Progress Report -- July 1, 2000 - June 30, 2001

Trainees

During the past year, 1,206 trainees attended 58 Continuing Education courses. An increase in worksite-based customized training and web-based courses have added significantly to the number of courses offered. About 38.56% came from government agencies, 18.49% from service industries, and 11.77% from manufacturing industries.

Among the four core professions, safety had the most attendees with 31.34% (378), industrial hygiene had 15.42% (186), nursing had 4.56% (55), and medicine had 3.90% (47). There were 56 engineers and 3 toxicologists among the participants in keeping with NIOSH's emphasis on providing safety and health to these professionals. There were also 139 worker representatives.

During 2000 - 2001, the majority of attendees came from Region X: 66.50% came from Washington, 7.38% came from Oregon, 3.23% came from Alaska, 0.50% came from Idaho. In addition to courses held in the Seattle area, courses were held elsewhere in Washington State in Bellingham, Bothell, Everett, Port Angeles, Poulsbo, Tacoma, Spokane, and Yakima. Courses were also held elsewhere in the nation in Anchorage, Alaska; Phoenix, Arizona; Tampa, Florida; Kansas City, Missouri; St. Louis, Missouri; Syracuse, New York; Portland, Oregon; Salem, Oregon; Austin, Texas; and Dallas, Texas.

Courses, 7/1/2000 - 6/30/2001

The courses held during 2000-2001 covered a number of issues in the Pacific Northwest and nationally. Machine Guarding and Metal Working Fluids was held in conjunction with the Washington Governor's Industrial Safety and Health Conference. Moving machine parts and machining fluids pose a significant risk to workers; these are risks safety and health professionals are generally not trained to deal with. This course presented up-to-date information on safety and health hazards in metal working and tool grinding, with an emphasis on evaluating and controlling hazards to prevent injuries and adverse health effects.

Recognizing the heightened interest focused on ergonomics at the international, national, and regional levels, three courses focusing heavily on ergonomics were presented this year. One was Ergonomics from an International Perspective held in conjunction with the Northwest Occupational Health Conference in Bellingham, Washington. This course focused on looking at Ergonomics practice and legislation regionally, nationally, and internationally. A second course, Ergonomics in the Workplace, provided participants opportunity to evaluate different job tasks through the application of multiple

hazard evaluation systems and widely accepted assessment tools. The third course, Current Issues in Construction Safety: Ergonomics, Noise, Lead, and Liability, incorporated ergonomics along with current noise and workers compensation hearing loss claims, new regulations involving disturbance of lead-based paint, training requirements for the construction industry, and proposed new silica regulations in a review of current happenings in safety and health in the Pacific Northwest.

Rural Eastern Washington was the logical setting for Agriculture Health and Safety for Children and Teens. This course focused on the prevention and treatment of health and safety illness and injuries among children in agricultural settings.

Industrial Ventilation: Principles & Applications provided enough knowledge of industrial exhaust ventilation for contaminant control that participants were able to design systems or evaluate the designs of others.

The Washington State Department of Health co-sponsored Zoonotic & Vector-borne Disease: Current and Emerging Issues in Washington and the United States. This course specifically addressed the needs of physicians, other healthcare workers, and veterinarians to understand the ecology and epidemiology of diseases such as rabies, Lyme disease, E. coli 0157:H7, etc. This course was videotaped and made available to physicians, safety and health professionals, veterinarians, and members of the general public.

University of Washington schools and departments outside of the Department of Environmental Health provided significant support in the delivery of training. The School of Nursing cooperated in the offering of An Aging Workforce: Issues for this Century; The University of Washington Graduate School of Public Affairs provided instructional support for Benefit-Cost Analysis of Policies in Environmental, Public & Occupational Health; Managers within the University's Environmental Health and Safety Department participated in developing the course Laboratory Safety & Health. The University of Washington School of Medicine, Continuing Medical Education jointly sponsored Occupational & Environmental Medicine: New Developments for Primary Care Clinicians. The Department of Civil and Environmental Engineering provided instructional expertise for Assessment of Exposure to Fine Atmospheric Particulate: Challenges and Progress.

In 2001 CE was asked to coordinate the Continuing Education component of the Fogarty Grant administered by the School of Public Health and Community Medicine. CE will work with partner institutions in Thailand, Vietnam, Nicaragua, and Costa Rica to identify important educational resources available in the Center and make them available through a) translating selected CE programs into Thai, Vietnamese, and Spanish and distributing them to physicians and other safety and health professionals b) delivering appropriate coursework via distance learning and c) developing and delivering courses, live, at partnering institutions. Another component of CE's participation will be to work with the CE Departments in partnering institutions in developing excellent CE programs that meet identified needs in each country.

Recruiting Training Candidates

In May 1999, a new marketing strategy was implemented designed to decrease course costs and increase course attendance. On May 15, 1999, CE launched its first comprehensive website. On May 16, 2001, a greatly improved and expanded website replaced this earlier version. The website includes a complete course schedule for all Department of Environmental Health (DEH) Continuing Education courses (Northwest Center and OSHA Education Center), on-line registration, on-line needs assessment survey, our mission statement, contact information, and relevant links and resources. In addition the new website has information on course speakers and course committees. Forms used by committees and instructors are also available. The new website has been met with much enthusiasm from our visitors. The website address is http://depts.washington.edu/ehce. Future plans for the website include expanded registration capabilities and delivery of video samples of course content for promotion.

The 1999 launch of the new website was coupled with the introduction of a DEH Continuing Education listserv. The purpose of the listserv is to inform health and safety professionals and others who may be interested in the activities of the program. Members of the listserv receive a monthly electronic newsletter, with schedule updates and other timely information. The listserv currently has over 1500 subscribers.

As a vital part of CE's marketing, the new website and listserv have helped reduce printed marketing materials and the costs associated with them. The cost of print marketing has been further reduced by printing fewer brochures, electing instead to send brochures only to persons in the database who have attended a Continuing Education course in the past three years. Individuals who have not attended a course in the past three years, but wish to remain on our mailing list, receive attractive postcards which direct them to call, email, or visit our website for more information on courses offered each year.

TABLE 1.
Continuing Education Courses
July 1, 1997 – June 30, 2001

DATES	COURSE	NUMBER OF PARTICIPANTS	PERSON DAYS
7/14-16/97	Safety and Health in Confined Spaces	18	54
7/17/97	Annual Hazardous Waste Refresher	29	29
7/18/97	Supervising Haz Waste Operations	18	18
7/21/97	Haz Materials Transportation (Bremerton)	20	20
8/6-8/97	Environmental Health for Educators	28	84
9/30-10/2/97	Leadership Skills for Occ. S & H Prof'ls	22	66
10/14/97	Toxicology: The Basics (Spokane)	49	49
10/15/97	Occupational Asthma (Spokane)	198	198
10/29/97	Behavior-Based Safety	155	155
11/3/97	Health Haz of Cosmetology (Portland OR)	40	40
11/4/97	Toxicology: The Basics (Portland OR)	50	50
11/19/97	EPA Standards / Particulate Matter & Ozone	59	59
11/21-22/97	2nd Int'l Fishing Industry Safety & Health	48	96
12/11/97	The Design and Analysis of Experiments	26	26
1/8/98	Toxicology: Intermediate	76	76
1/28-30/98	Annual Hazardous Waste Refreshers	78	29
2/2/98	Annual Haz Waste Refresher (Spokane)	12	12
2/19/98	Evaluating Health and Safety Programs	63	63
2/27/98	Construction Safety Update	38	38

3/12-13/98	Overview of Occupational Health Nursing	45	90
3/19/98	Metal Working Fluids (Salem OR)	30	30
3/19-20/98	Laboratory Safety and Health	91	182
4/1-3/98	Occupational Hazards to Health Care Workers	57	171
4/9/98	Implementing an Ergonomics Program	68	68
4/22-24/98	Managing Hazardous Materials Incidents (Richland)	30	90
5/21/98	Musculoskeletal Disorders (Olympia)	162	162
5/21/98	Farm Health and Safety (Yakima)	74	74
6/4-5/98	Respiratory Protection	40	80
6/8-9/98	Respiratory Protection (Anchorage, AK)	40	80
6/15-19/98	Sampling &Evaluating Airborne Asbestos Dust	8	40
6/24-26/98	Industrial Ventilation	23	69
7/20-22/98	Hazardous Waste Operations	125	375
7/23/98	Annual Hazardous Waste Refresher	26	26
7/24/98	Hazardous Materials Transportation	17	17
7/27-29/98	Sampling for Hazardous Materials	14	42
7/31 – 8/1/98	King Co. Fire Respiratory Protection	41	82
9/23/98	Best Practices in Ergonomics	300	300
10/2/98	Legal Aspects of Construction Safety	38	38
10/7/98	Emerging Pathogens	307	307
10/28/98	Respiratory Protection Programs	99	99
11/2-4/98	Respiratory Protection: Advanced	23	69
11/6/98	Environment, Safety, Health and The Bottom Line	22	22
12/3/98	A Small Dose of Toxicology	103	103
1/13/99	Occupational Noise Update	53	53
1/25/99	Annual Hazardous Waste Refresher	18	18
1/26/99	Annual Hazardous Waste Refresher	29	29
1/27/99	Annual Hazardous Waste Refresher	37	37
2/4/99	Indoor Air Quality	112	112
2/19/99	Return to Work Programs	85	85
3/16-18/99	Comprehensive Review of IH	32	96
3/30/99	Ergonomics in the Forest Products Industry	78	78
4/8/99	Health and Safety in Commercial Fishing	32	32
4/20/99	Occupational Skin Disorders	81	81
4/28/99	Effective Worker Training	62	62
7/19/99	Supervising Hazardous Waste Operations	11	11
7/20/99	Hazardous Waste Annual Refresher	22	22
7/21-23/99	Sampling for Hazardous Materials	4	12
7/26/99	Hazardous Waste Annual Refresher	8	8
9/13-15/99	Non-Ionizing Radiation Protection: An Overview	21	63
9/20-22/99	HazMat Incidents: Improving Interagency Response	26	78
10/13/99	Making a Business Case for Health and Safety	167	167
10/19/99	Improving Safety & Health: Learning from Programs that Work	37	37
11/1/99	Radiation Risk Communication: Implications of New Thyroid Disease & Fallout Data	36	36
11/16/99	Preventing Workplace Violence	53	53
1/24/00	Hazardous Waste Annual Refresher	25	25
1/25/00	Hazardous Waste Annual Refresher	25	25
1/26/00	Hazardous Waste Annual Refresher	30	30
2/11/00	Pesticide Medicine	79	79
2/16/00	Preventing Musculoskeletal Disorders	104	104
3/2/00	Psychosocial Factors in Occupational Health & Safety	66	66
4/5/00	Wood Dust Exposure: The Proposed New Exposure Guideline and How It May Affect the Woodworking Industry	58	58
4/28/00	Environmental Health Issues In Children: What Pediatricians & other Primary Care Providers need to	50	50

	Know		
5/3-4/00	9th Conference on Occupational Hazards to Health Care Workers	67	134
5/5/00	Safe Needles Save Lives: Learn How to Prevent Needlesticks	46	46
5/8-10/00	24-Hour Hazardous Material Emergency Response Training	19	57
7/24-25/00	Safety and Health Issues in Confined Spaces	4	8
7/26/00	Annual Hazardous Waste Refresher	27	27
7/27/00	Hazardous Materials Transportation	7	7
9/6/00	8-Hour Cell Site Safety Awareness (Bothell, WA)	17	17
9/7/00	8-Hour Cell Site Safety Awareness (Bothell, WA)	20	20
9/13/00	8-Hour Cell Site Safety Awareness (Portland, OR)	7	7
9/14/00	8-Hour Cell Site Safety Awareness (Portland, OR)	21	21
9/19-21/00	Hazardous Materials Incidents (Port Angeles, WA)	26	78
10/3/00	Health and Safety in Metalworking Industries (WA Governor's Industrial Safety and Health Conf.)	33	33
10/18/00	Ergonomics from an International Perspective (Northwest Occupational Health Conference, Bellingham)	199	199
11/2/00	Agricultural Health and Safety for Children and Teens (Yakima, Washington)	27	27
11/2/00	8-Hour Cell Site Safety Awareness (Kansas City, MO)	20	20
11/3/00	8-Hour Cell Site Safety Awareness (Kansas City, MO)	8	8
11/8/00	8-Hour Cell Site Safety Awareness (Phoenix, AZ)	14	14
11/9/00	8-Hour Cell Site Safety Awareness (Phoenix, AZ)	22	22
11/16/00	8-Hour Cell Site Safety Awareness (St. Louis, MO)	12	12
11/17/00	8-Hour Cell Site Safety Awareness (St. Louis, MO)	11	11
11/27/00	Confined Space Entry Training	22	22
11/30/00	8-Hour Cell Site Safety Awareness (Syracuse, NY)	9	9
12/1/00	8-Hour Cell Site Safety Awareness (Syracuse, NY)	9	9
12/4-5/00	Industrial Ventilation: Principles and Applications	21	42
12/4-5/00	Spirometry Training for Worker Screening (Tacoma, WA)	7	14
12/7/00	8-Hour Cell Site Safety Awareness (Tampa, FL)	19	19
12/8/00	8-Hour Cell Site Safety Awareness (Tampa, FL)	19	19
1/11/01	8-Hour Cell Site Safety Awareness (Austin, TX)	17	17
1/12/01	8-Hour Cell Site Safety Awareness (Austin, TX)	13	13
1/24/01	Annual Hazardous Waste Refresher	31	31
1/25/01	Annual Hazardous Waste Refresher	29	29
1/26/01	Annual Hazardous Waste Refresher	27	27
1/31/01	Machine Guarding Safety	8	8
2/1/01	Current Issues in Construction Safety	53	53
2/7/01	8-Hour Cell Site Safety Awareness (Dallas, TX)	19	19
2/8/01	8-Hour Cell Site Safety Awareness (Dallas, TX)	18	18
2/23/01	Zoonotic and Vector-Borne Disease	69	69
2/24-25/01	Spirometry Training for Worker Screening	6	12
3/2/01	An Aging Workforce	26	26
3/15-16/01	Laboratory Safety and Health	40	80
3/15/01	Fall Protection Training	18	18
4/6/01	Occupational and Environmental Medicine	23	23
4/13/01	Benefit-Cost Analysis of Policies in Environmental, Public, and Occupational Health	23	23
4/17-18/01	Construction Safety and Health Training(Anchorage, AK)	15	30
4/30-5/1/01	Supervisory Safety and Health Duties (Anchorage, AK)	17	34
5/1/01	Ergonomics in the Workplace	78	78
5/1-2/01	Construction Safety and Health Training(Anchorage,	6	12

	AK)		
5/8-9/01	Spirometry Training for Worker Screening	9	18
5/16/01	Assessment of Exposure to Fine Atmospheric Particulate	26	26
6/1/01	Environmental Health for Reporters	27	27
Online	Asbestos (General Industry)	2	N/A
Online	Defensive Driving	3	N/A
Online	DOT Training for Offerers of Non-Bulk HazMat Packages	3	N/A
Online	Electrical Safety (General Industry)	1	N/A
Online	Ergonomics in the Office	7	N/A
Online	Hazard Communication	1	N/A
Online	Hazardous Waste Operations and Emergency Response	2	N/A
Online	Hearing Conservation	2	N/A
Online	Ladders and Stairs (Construction)	2	N/A
Online	Permit-Required Confined Spaces	3	N/A
Online	Spill Prevention Control and Countermeasures	1	N/A
Totals:	162 courses	6,961 participants	8,938 person days

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INDUSTRIAL HYGIENE

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OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Memorandum

Date November 5, 2002

From Principal Engineer, OEP, NIOSH

Subject Final Progress Report for entry into NIOSHTIC2/NTIS for NIOSH Training Grant No. T42 CCT 010418

To Vern P. Anderson, Chief, IRB, EID (C-18)

The enclosed report has been received from the Center Director to document work performed during the specified grant project period. The following information applies to the designated Education and Research Center (ERC):

Title: Northwest Center for Occupational Health and Safety

Center Director: Michael S. Morgan, Sc.D.
School of Public Health & Community Medicine
University of Washington
Seattle, WA 98195-7234

Grant No.: T42 CCT 010418

Project Period: 7/1/97 - 6/30/2002

Please place the report in DIDS and I also recommend it for entry into NIOSHTIC2 and submission to NTIS.

Thanks for your assistance.

John T. Talty, P.E., DEE

cc: S. Board/A. Berry, OEP
B. Kuchinski, OEP

Enclosure

fpr.uwa