



FINAL PERFORMANCE REPORT

**NIOSH Educational Resource Center
Training Grant in Occupational Health and Safety**

Grant Number T42/CCT610417

July 1, 1990 to June 30, 1995

The University of Texas - Houston Health Science Center

School of Public Health

**THE SOUTHWEST CENTER FOR OCCUPATIONAL AND ENVIRONMENTAL
HEALTH**

Houston, Texas 77225

**Lawrence W. Whitehead, Ph.D., Center Director
Principal Investigator**

**The Southwest Center for Occupational and Environmental Health
The University of Texas - Houston
School of Public Health
May, 1996**

on5esw347b

TABLE OF CONTENTS

Title Page	-
Table of Contents	1
Abstract	2
Significant Findings - Conclusions	3
General Introduction	5
Program Reports	
I. Occupational Medicine	5
II. Occupational Health for Nurses	10
III. Industrial Hygiene	18
IV. Industrial Hygiene and Safety Engineering - Texas A&M	24
V. Center Administration	26
VI. Continuing Education	36
VII. Outreach	39

ABSTRACT

PURPOSE AND PROGRAM CHARACTERISTICS

The Southwest Center for Occupational and Environmental Health, in the grant period of 1990-1995 reported herein, has provided academic training in the core areas of industrial hygiene (MPH, MS and PhD), occupational health for nurses (MPH, MPH/MSN, DrPH), occupational medicine (MPH and residency in occupational medicine), and, for part of the grant period, safety engineering and hazardous substance training. In addition to theory and practice courses in the specialties, these academic programs include joint coursework in occupational and environmental health as well as coursework in the principle disciplines of public health: epidemiology, biostatistics, and, for MPH and DrPH, behavioral sciences and management and policy sciences. Relevant electives are offered to round out the academic preparation of the NIOSH trainees. Interdisciplinary courses and activities are offered to ensure interaction between faculty and students in the core disciplines. In addition to the academic training program, research has been conducted in each of the three core areas listed above.

The Continuing Education and Outreach program of the Center has offered courses annually in a five state region to practicing occupational health professionals, professionals in related disciplines, paraprofessionals and technicians. These course offerings have provided opportunities for continuing education in a variety of aspects of occupational and environmental health. The Center Outreach program, besides general purpose outreach, has developed a focus on the needs among the healthcare industry including, but not limited to, the following areas: infection control, ergonomics, and industrial hygiene. Consultation, lectures/presentations and collaboration with professional associations have been and are also key elements of the Center outreach activities.

TRAINEES

Traineeships have supported stipends, tuition and fees, and travel for predoctoral students majoring in industrial hygiene, occupational health for nurses, and for postdoctoral students in occupational medicine. Twenty-seven industrial hygiene graduates were produced in the five years, including three doctoral graduates. Sixteen of the graduates received NIOSH trainee support. Sixteen physicians completed occupational medicine residency training, approximately ten of whom received NIOSH support in the MPH year. Six students graduated in occupational health for nurses, five of whom received traineeships. From Texas A&M, during the three years of the five year grant with NIOSH funding for Texas A&M, twelve students graduated in industrial hygiene, and twenty in safety engineering. 4911 students attended CE courses of the Houston programs of the Center over the five years, and many also took hazardous substance training at Texas A&M.

The SWCOEH at the UT School of Public Health has grown and strengthened substantially during the five year grant period reported, and continues to do so.

SIGNIFICANT FINDINGS - CONCLUSIONS

The Southwest Center for Occupational and Environmental Health (SWCOEH) at the University of Texas - Houston, School of Public Health, is the NIOSH-funded Educational Resource Center for Texas and Region 6. This Final Performance Report covers the funded grant period July 1, 1990, through June 1, 1995. In overview, the SWCOEH has succeeded very well. The component programs at Houston - occupational medicine, occupational health for nurses, industrial hygiene, continuing education and outreach, and center administration have all been successful at stable or growing levels. Only the programs at Texas A&M - industrial hygiene, safety engineering, and hazardous substance training (continuing education) - have left the Center during the grant period. Each component of the Center is reviewed below in a separate section, in general reporting goals set for the five year grant period, and progress in achieving them.

In the 1990-1995 period, the Occupational Medicine program at the University of Texas School of Public Health has been characterized by significant growth and consolidation. Growth is exemplified by recruitment of a new full-time Director; addition of two faculty members; expansion of course offerings and rotation sites (in variety and number); establishment of a combined residency track (internal medicine/occupational medicine); addition of an occupational health clinic; and growth of its research program. Consolidation has been achieved through maintenance of NIOSH funding and ACGME accreditation, increasing the variety of donors to the program, by gaining greater visibility as a resource to other regional and international programs in occupational health, and by consistently graduating residents of outstanding caliber. The program was renewed for five years following the 1994 site visit.

The Program in Occupational Health for Nurses continues to develop. Extensive strengthening has occurred in the five year grant period 1990-1995. Increased collaboration with the School Of Nursing of UT is being sought and will enhance program efforts. The current program director will leave the program in 1996, and successful faculty recruitment is crucial to continued and increased success. The program was renewed for three years following the 1994 NIOSH site visit.

The Program in Industrial Hygiene at UT is stable and mature. The strongest programmatic area in the IH program is that of exposure assessment and related work with epidemiologic studies and other health-effects activities. All three faculty teach in the area of exposure assessment and strategies, and all have worked with epidemiologic studies regarding exposure assessment. Dr. Maria Morandi is a member the EPA Science Advisory Board Committee on Indoor Air and Total Human Exposure Assessment. Dr. Lawrence Whitehead is a member, AIChE short-course instructor, and session arranger for 1995 and 1996 for the AIHA Exposure Assessment Strategies Committee. Dr. Thomas Stock is a member of several community organizations in Houston interested in assessment of environmental pollutant exposure and health effects, including the Houston Environmental Foresight Program (an EPA environmental priorities setting project), the regional Air Quality Planning Committee of the

Houston-Galveston Area Council, and the Environmental Health Committee of the ALA. The overlap into community air exposure issues is typical of total environmental exposure assessment, and is appropriate to broadening interests in industrial hygiene today. The program is very stable, maintains a steady enrollment, is well-received in the job market, and has an experienced and stable faculty. The program was successfully reviewed for a five-year renewal by NIOSH in late 1994, for the period 1995-2000.

Programs at Texas A&M University in Industrial Hygiene and in Safety Engineering were part of the SWCOEH through 1992-93, with a closeout year in 1993-94. These programs continue to operate successfully without NIOSH funds. Also part of the Center from 1990 through 1994 was a program in hazardous substance training (continuing education) at Texas A&M, that is now separate from the Center.

Center Administration continues to provide a sound base for NIOSH and other educational and research activities. A well trained core of support personnel and physical facilities make this an excellent site for education, research and outreach. Our proximity to the Texas Medical Center also provides a unique venue for investigation and teaching. Under stable leadership with capable faculty who are productive in the academic and research community, the NIOSH ERC received in 1994 the highest site visit rating since its inception in 1977, and was renewed for five years (1995-2000). The outreach activities of the Center and the academic programs are strong. Well trained students graduate from these programs, in addition to the continuing education courses, who serve the occupational health needs of the community at large.

The Continuing Education Program has had three different Directors during this period, but has continued to move forward in number of courses offered and number of attendees. Eight annual CE Institutes have been conducted with the ninth institute planned for 1996. New courses have been developed in response to audience needs, and existing courses have been revised/modified. Different types of needs assessment methods have been tried. Relationships with outside organizations have been developed. In summary, the Continuing Education Program has offered quality courses in a variety of subject areas, in a variety of locations, receiving consistently positive feedback. The Program will continue to be responsive to the needs of health and safety professionals in the region.

The SWCOEH outreach program has been active throughout the grant period, and in the last two years has added a particular focus on health care workers health and safety activities in addition to general outreach.

GENERAL INTRODUCTION

The Southwest Center for Occupational and Environmental Health (SWCOEH) at the University of Texas - Houston, School of Public Health, is the NIOSH-funded Educational Resource Center for Texas and Region 6. This Final Performance Report covers the funded grant period July 1, 1990, through June 1, 1995. In overview, the SWCOEH has succeeded very well. The component programs at Houston - occupational medicine, occupational health for nurses, industrial hygiene, continuing education and outreach, and center administration have all been successful at stable or growing levels. Only the programs at Texas A&M - industrial hygiene, safety engineering, and hazardous substance training (continuing education) - have left the Center during the grant period. Each component of the Center is reviewed below in a separate section, in general reporting goals set for the five year grant period, and progress in achieving them.

PROGRAM REPORTS

I. OCCUPATIONAL MEDICINE

1. Background

The Occupational Medicine (OM) Program at the University of Texas School of Public Health (UTSPH) has been accredited as a residency program by ACGME since 1977. Approval for 5 years was awarded by NIOSH in its last competing review (1994), for the period 1995-2000. Degrees offered include a Certificate of Residency in Occupational Medicine; in addition, through the Occupational Health module, a Master of Public Health (MPH) and a Doctor of Public Health (DrPH) degrees are available.

The program consists of a two-year residency in Occupational Medicine involving one academic year leading to the Master of Public Health (MPH) degree and one practicum year. Coursework in the academic year is completed at the School of Public Health; a thesis is required for the MPH degree. At least one clinical practice year, and preferably more, is required before participating in the practicum portion of the residency. The practicum year consists of block rotations in industrial (plant and corporate) medical departments, occupational medicine clinics and electives. Students completing the program are usually eligible to take the American Board of Preventive Medicine (Occupational Medicine) certifying examination, after an additional year of practice. Opportunities exist for an additional (post-residency) year of research training in occupational and environmental health.

As of 1995, a combined (4 year) residency training track in internal medicine and occupational medicine is also offered, jointly with the Baylor College of Medicine Department of Internal Medicine; approval for this program has been obtained from the American Boards of Internal Medicine and Preventive Medicine.

2. Goals and Objectives

The goals of the Occupational Medicine Program are to provide multidisciplinary and advanced preparation in occupational and environmental health and occupational medicine for physicians; to increase the level of occupational health and safety knowledge for medical school students and practicing physicians by providing regional continuing education and outreach; to provide research training for physicians; and to conduct research in related areas. In order to accomplish these goals, six objectives were established for the 1990-1995 period.

1. Continue OM Residency training and expand quantity and quality of clinical practice sites.

a) The OM residency was successfully reaccredited by the Accreditation Council on Graduate Medical Education (ACGME) in 1994, for a period of five years.

b) Several new practicum year elective rotations (funded and unfunded) were added:
a) the Occupational Medicine Clinic at the University of Texas Health Science Center in Tyler; b) the OSHA Medical Office in Washington; c) the University of Texas M.D. Anderson Cancer Center Environmental Safety; d) the U.S. Postal Service; and e) American Airlines.

c) Jointly with the University of Texas School of Nursing, the OM Program opened a new interdisciplinary student and employee health clinic (now called University of Texas Health Services) in September 1992. The primary target population of the clinic is the approximately 9,000 employees and students of the UT Houston Health Science Center; however, outside occupational medicine referrals and contracts are also serviced. Clinic staff are also active in occupational health policy development and program implementation for the university. OM physician faculty, as well as academic year residents, spend one half-day per week in the clinic evaluating occupational health patients. Weekly interdisciplinary didactic sessions, and a monthly research seminar, are held at the clinic, organized by the OM residents. As of 1995, the clinic is a member of the Association of Occupational and Environmental Clinics (AOEC).

d) Since March 1994, the OM Program has been contracted to provide state of the art pulmonary function quality control and overreading services; the average number of tests reviewed per month is about 750. Residents participate in this program, under faculty supervision, in order to gain experience in cross-sectional and longitudinal pulmonary function surveillance.

2. Increase interdisciplinary educational activities and research opportunities for OM residents.

The OM Program was awarded several new research grants in the 1990-1995 period, primarily in the areas of occupational hazards of health care workers, chronic beryllium lung

disease, occupational injury and illness reporting, and international occupational health. Several students, at both the masters and doctoral levels, have used data derived from these studies for thesis or dissertation work. Close ties with the Baylor Pulmonary Section have allowed joint UT OH-Baylor Pulmonary fellows to conduct thesis research with data from Baylor. Students have also used information from the UT Health Services Clinic to do masters thesis work.

There is a strong emphasis on interdisciplinary activities, reflected in continuing education activities, course curricula, journal club sessions, research opportunities, participation in the university student and employee health clinic, and general social gatherings.

3. Increase OM faculty research capability by recruiting a new OM Program Director and fill the proposed two additional positions with physicians who have demonstrated research experience and expertise.

In 1993, Dr. George Delclos was recruited as Program Director upon the retirement of Dr. Marcus Key. Dr. Delclos is an occupational and pulmonary physician.

Arch Carson, M.D., Ph.D., was recruited to the OM faculty, on a 50% time basis, in October 1992; this was increased to 75% time in September 1995. In addition to being an occupational physician, Dr. Carson has expertise in clinical toxicology.

In 1995, a search for another junior OM faculty member was concluded with the hiring of Xifeng Wu, M.D., Ph.D. Dr. Wu is an occupational physician with expertise in molecular biology and in molecular epidemiology. The emphasis of her new position will be to expand the research agenda of the occupational medicine program by conducting research in the area of markers of individual susceptibility to occupational disease, with an emphasis on biomarkers and cancer. Her position is jointly funded with the M.D. Anderson Cancer Center Department of Epidemiology, and a state of the art cytogenetics/molecular biology laboratory has been equipped at the School of Public Health for her research activities.

4. Increase continuing education opportunities in occupational health and safety for physicians in the region.

Refer to Section VI, Program in Continuing Education.

5 and 6. Provide outreach to medical schools and community-based educational programs throughout the region. Explore the possibilities and opportunities for joint residency programs with medical schools and other academic institutions in Houston and Texas.

At the local level, the joint Baylor/UTSPH internal medicine and occupational medicine residency track was approved, as noted above. In addition, residents in internal

medicine and family practice programs have taken elective rotations in the OM Program, for periods of 1-2 months. OM faculty periodically lecture and provide preceptorships at both Houston medical schools, as well as advisory services to the Texas Department of Health Preventive Medicine Residency Program. Participation in activities concerning the occupational hazards of healthcare workers has led to frequent lectures, meetings and problem-solving sessions with local area hospital employee health programs.

At the regional level, the UTSPH OM program was instrumental in helping UT Tyler develop their own occupational medicine residency program, by providing the academic (M.P.H.) year of that program. In 1994, that program received provisional accreditation from ACGME. Several UTSPH OM residents have taken elective 2-month rotations at the UT Tyler Occupational and Environmental Medicine Clinic.

At the international level, the SWCOEH has received in 1995 a 5 year training grant award from the Fogarty International Center/NIEHS/NIOSH to provide postgraduate training in occupational epidemiology, industrial hygiene, toxicology and/or industrial safety and ergonomics for foreign students; Dr. Delclos is the Principal Investigator. Through the WHO Collaborating Centre in Occupational Health, directed by Dr. Delclos, regular participation in teaching, research and outreach activities is being provided to several countries, primarily in Venezuela, Colombia, Mexico, Costa Rica and Spain.

3. Students and Graduates

Since starting in 1977, the UTSPH OM program has graduated 38 physician residents. In the 1995-1996 academic term, there were two academic year and five practicum year residents, as well as one resident in the combined internal medicine/occupational medicine track. NIOSH funding has typically been available for two residents per year; stipend support for the remaining residents has come from donations from local area clinics, Baylor College of Medicine, corporations, the state occupational medicine professional society and OSHA.

In addition to the Occupational Medicine residents, other community physicians enroll in the Occupational Health MPH and Doctoral Programs, often on a part-time basis. This is a valuable means of providing training in occupational health for family practice and emergency medicine physicians, as well as for international students who are also physicians.

The following table lists OM program graduates for the period 1990-1995.

name	date residency completed
George Carrion, M.D.	June 30, 1991
John Conte, M.D.	May 31, 1991
Marshall W. Anderson, M.D., M.P.H.	August 31, 1991
Robert Braco, M.D., M.P.H.	September 30, 1991

Scott Mitchel McKenna, D.O., M.Sc., M.P.H.	July 14, 1992
Arch I. Carson, M.D., Ph.D.	September 30, 1992
Steven Robert Ellsworth, M.D., M.P.H.	June 30, 1992
Mary Ann Khoury, M.D., M.P.H.	December 14, 1992
Ahmed A.H. Khalifa, M.D., M.P.H.	December 31, 1992
Grethe E. Wik, D.O., M.P.H.	June 30, 1993
Faiyaz A. Bhojani, M.D., M.P.H.	June 30, 1993
Tufail Q. Shaikh, M.D., M.P.H.	July 31, 1994
Venessa Ann Holland, M.D., M.P.H.	January 19, 1994
Martin M. Hernandez-Torre, M.D.	February 28, 1994
Bonnie A. New, M.D., M.P.H.	June 30, 1995
Ali R. Chughtai, M.D., M.P.H., M.Phil.	November 30, 1995

4. Curriculum

The MPH curriculum in Occupational Medicine includes the following course of study in the academic (MPH) year:

PH6615 Fundamentals of Industrial Hygiene	4 credits
PH2175 Principles of Toxicology	3 credits
PH1610 Introduction to Biometry	4 credits
PH2610 Introduction to Epidemiology	4 credits
PH3610 Administration and Public Health	4 credits
PH6610 Occupational Health	4 credits
PH6680 Clinical Occupational Medicine	4 credits
PH6998 Field Trips in Occupational Health	2 credits
PH6998 Workplace Safety Seminar	1 credit
PH1110 Social and Behavioral Aspects of Community Health	3 credits
Electives(*)	varies
PH9998 Thesis research	varies

(*) Recommended electives include Occupational Epidemiology, Environmental Epidemiology, Proposal Development, Occupational and Environmental Respiratory Disease, Radiation Safety, Environmental Health Law.

In the practicum year, residents spend 4 to 8 months in two or more large industry rotations (chiefly at Dow Chemical, Union Carbide, Shell, and/or Exxon). Residents also spend 4 to 6 months in shorter clinical rotations, including the Milby Clinic, Kelsey-Seybold Clinics, and different University of Texas and/or Baylor College of Medicine-affiliated clinical sites. Elective rotations (1-2 months) may be taken at the U.S. Postal Service, American Airlines, M.D. Anderson Cancer Center Environmental Safety, and the Occupational Medicine Office at OSHA headquarters, among others. Required seminars include a weekly didactic session, journal club, a quarterly guest faculty conference and a

research seminar.

5. Conclusions

In the 1990-1995 period, the Occupational Medicine program at the University of Texas School of Public Health has been characterized by significant growth and consolidation. Growth is exemplified by recruitment of a new full-time Director; addition of two faculty members; expansion of course offerings and rotation sites (in variety and number); establishment of a combined residency track (internal medicine/occupational medicine); addition of an occupational health clinic; and growth of its research program. Consolidation has been achieved through maintenance of NIOSH funding and ACGME accreditation, increasing the variety of donors to the program, by gaining greater visibility as a resource to other regional and international programs in occupational health, and by consistently graduating residents of outstanding caliber.

II. OCCUPATIONAL HEALTH FOR NURSES

1. Background

The Program in Occupational Health for Nurses at The University of Texas School of Public Health (SPH) completed its first five years of funding from NIOSH in 1994/95. Previous to 1990, there had not been a NIOSH approved program for nurses in the Texas Educational Resource Center since 1982. After the November 1994 NIOSH site visit, the Program in Occupational Health for Nurses at SPH was approved for three years. On November 1, 1991, M. Kay Garcia, RN, MS, was appointed as Interim Director, and on September 1, 1993 she became the permanent Program Director after completing her DrPH degree.

Currently, the program prepares occupational health nurses (OHNs) for expanded practice in a variety of settings through the Master of Public Health (MPH) option offered through the Occupational Health/Aerospace Medicine module at the SPH or through a dual degree in nursing and public health (MPH/MSN) offered in collaboration with The University of Texas School of Nursing (SON). Students who are interested in the dual MPH/MSN degree option must be admitted to both the SPH and the SON separately. For the MPH, satisfactory completion of a prescribed course of study of at least one academic year, a minimum of 36 credit hours, and demonstration of a breadth of knowledge in the areas basic to public / occupational health as well as satisfactory completion of a research thesis is required. For the dual degree, a minimum of 71 credit hours and a joint SPH / SON thesis project is required.

The focus of the MPH/MSN coordinated degree program is to prepare a public health / occupational health nurse specialist for advanced practice. Nurses enrolled in the program will study a nursing clinical specialty (i.e., women's health, mental health, oncology, or

emergency nursing) and will learn a public health nursing specialist role in occupational health through collaboratively taught courses and practice experiences. The curriculum is designed to enable graduates to sit for the American Nurses Association's Certification exam as a Clinical Specialist in Community Health Nursing as well as to provide the necessary knowledge base for Certification in Occupational Health Nursing offered by the American Board for Occupational Health Nurses.

2. Goals and Objectives 1990-1995

The goal of the academic program is to facilitate the development of nurse administrators, consultants, educators and researchers in occupational health. The goal of the continuing education / outreach component is to provide practicing occupational health nurses with opportunities for maintaining and improving expertise and to enhance awareness of occupational health and safety issues among audiences throughout the region.

1. Recruit a full-time faculty member after funding is secured.

State funding was approved for 50% of the Director's position (non-tenure track) with the remaining 50% supported by NIOSH. From November 1, 1991 through August 31, 1995, M. Kay Garcia devoted 100% of her time to the program or to related activities. She was initially named as Interim Program Director, and after completion of the DrPH degree in 1993, she became the permanent Program Director. Since September 1, 1995, Dr. Garcia has devoted 50% of her time to the program and plans to leave the SPH in August 1996. Currently, a search is underway for a new program director.

2. Refine and strengthen the MPH Program in Occupational Health for Nurses.

At the time of the 1989 site visit, the program was in the very early stages of development with only a few students having taken the OHN courses. Since that time, an adequate number of course evaluations have been completed by students, feedback has been provided by faculty, and the OHN Advisory Sub-committee has been solicited for input. Based on those comments, revisions have been made in the curriculum.

Currently, OHN students are required to take at least two courses which include field or practicum experiences. The Occupational Health Field Trips class is offered in the Spring and students participate in 5 to 6 interdisciplinary walkthrough assessments in a variety of settings. In addition, in the OHN II-Practicum course, students are placed with a preceptor of their choice for approximately 132 contact hours. There is also a field project requirement for students who opt to take PH 6998 Occupational Ergonomics. A program evaluation plan has been developed which includes evaluation of the curriculum on a per course basis by students and annually by faculty and the OHN Advisory Sub-committee.

A criticism from the 1994 site visit was "concern about an inability to become employed as OHNs because of their lack of practical experiences..." The report continued to

state that the program did not provide adequate clinical preparation for students. The current Director strongly disagrees with these comments. Since all of the students interviewed at the site visit except one were employed full or part-time as COHNs, the comment regarding employability and practical experience as OHNs seems highly inappropriate. Furthermore, the MPH curriculum is not, and has never been, advertised as having a clinical focus. It focuses on administration with an emphasis on program development and evaluation. When information is requested from an interested party about the program, it is emphasized that this is not a nurse practitioner program, that additional coursework is available, and arrangements should be made to take more courses if clinical skills need to be enhanced. This is one reason the MPH/MSN dual degree program was developed.

3. Develop and offer continuing education (CE) and professional development courses and activities for practicing occupational health nurses.

OHN faculty have been very active in the CE program in the last five years. Offerings for OHNs have included: Pulmonary Function Training, CAOHC Audiometric Training, Orientation to Occupational Health Nursing, Physical Assessment Skills for Occupational Health Nurses, and the COHN Exam Review course. Additional offerings in which OHN faculty have participated include: Workplace Ergonomics, Managing Employee Health Programs, and Employee Risks and Hazards - Hospital Design Issues. Currently, the Orientation to Occupational Health Nursing course is held in conjunction with the Texas State Association of Occupational Health Nurses (TSAOHN) Fall conference. Negotiations continue with the TSAOHN to co-sponsor programs, and input on the development of CE will be solicited from the OHN Advisory Sub-committee.

4. Continue to develop, implement, and evaluate a formalized outreach plan.

A formalized plan for Center Outreach was developed. Although activities involve a variety of target groups, the focus of the Center's effort involves health and safety issues of healthcare workers. The OHN program's outreach includes this focus with a special emphasis on nurses.

5. Explore and develop opportunities for collegial and collaborative relationships with nursing programs in the region.

In December 1993, Dr. Garcia received a cross-appointment to The University of Texas SON. Since then, she has become actively involved in the Division of Community Health, has collaborated on submission of two research proposals, and participates in activities of the SON Research Committee.

In addition to working with the SON, Dr. Garcia has held discussions with Prairie View A&M University, School of Nursing faculty and Associate Dean (Lillian Bernard, PhD) as well as the faculty and Dean (Sandra Blassingame, PhD) from Dallas Baptist University regarding the inclusion of occupational health and safety content into undergraduate nursing

curricula. Information regarding OSHA's 1910.1030 Bloodborne pathogens standard was provided to students of Prairie View A&M University before beginning clinical rotations. Discussions have also been held with Prairie View A&M University regarding the potential for collaborative research.

Another criticism in the 1994 site visit report was that "there is very limited interaction with the School of Nursing faculty...". Again, the current Director disagrees with this comment. In December 1993, Dr. Garcia received a cross-appointment to the SON, and two SON faculty have been cross-appointed to the SPH. Dr. Garcia has been actively involved in the Division of Community Health, and collaborative research is underway. In addition, development of the MPH/MSN program demonstrates a major commitment to SON/SPH collaboration.

6. Conduct a regional needs assessment survey regarding the inclusion of occupational health and safety content in undergraduate and graduate nursing curricula.

With the 1992 non-competitive renewal, funding from NIOSH was requested, but sufficient funds were not approved, to conduct a regional needs assessment regarding the inclusion of occupational health and safety content in undergraduate and graduate nursing curricula. Although funding was not available for a regional needs assessment, a small amount of funding was received to conduct a survey in Texas as part of a study supported by the State Legislature. Findings revealed that very few programs include occupational health and safety content at the undergraduate level, and of those that do, only a small amount of lecture time is allotted to the topic. Results from the study, which were documented in a report to the State Legislature in March 1993, included a recommendation for the Board of Nurse Examiners to mandate undergraduate nursing schools to require an introduction to occupational health and safety with a clinical rotation in industry and a recommendation for funding a competitive grant to develop and implement strategies for instituting occupational health and safety content into undergraduate nursing curricula.

After the Texas survey, a list of nursing programs and contacts was developed for Louisiana, Oklahoma, New Mexico, and Arkansas. Due to limited funding, an abbreviated telephone survey was conducted instead of a formalized mail-out for each state. As in Texas, programs which provide specialized training in occupational health nursing are minimal in other parts of the region.

7. Obtain tenure-track approval at an Assistant or Associate Professor level for the Program Director position.

On September 1, 1993, M. Kay Garcia, RN, DrPH was appointed as the permanent Director of the Program at an Assistant Professor level. State funding for 50% of the position was secured, although it currently remains non-tenure track. The Center underwent tremendous change in the five-year cycle with loss of the Center Director (Patricia Buffler,

PhD) and the former Program Director (Mary Nickolaus, DrPH). Obtaining approval for a tenure-track position has been delayed. A criticism in the 1994 site visit report was "a lack of institutional support." Efforts are underway to remedy this perception.

8. Develop a joint MSN/MPH degree program for OHNs in collaboration with the SON.

A joint SPH / SON committee developed a plan for nurses who wish to pursue concurrent Master of Science in Nursing and Master of Public Health (MSN/MPH) degrees. The committee designed a curriculum which meets both SPH and SON requirements. The program's focus is to prepare a public health / occupational health nurse specialist for advanced practice.

The curriculum requires 71-72 credit hours with one jointly supervised thesis. Each student will be assigned an advisory committee comprised of the student, MPH advisor from SPH, MSN advisor from SON, and at least one additional faculty member who is randomly selected. The committee will meet with the student at least once each semester to review the student's progress.

9. Achieve NIOSH approval for the DrPH Program in Occupational Health for Nurses in order to assist nurses preparing for leadership careers in occupational health education, research and administration.

In the past, several nurses have entered the occupational health module in pursuit of the DrPH degree. There have been approximately four graduates to date. Developing a DrPH program with NIOSH funding would enable more students to seek career opportunities in teaching, advanced administrative practice, and research. Unfortunately, the DrPH program research training proposal was not approved in the 1994 NIOSH site visit.

10. Pursue additional opportunities and funding for faculty/student research.

Collaborative research opportunities with the SON and with Prairie View A&M University, College of Nursing were explored. The focus was on developing research related to occupational hazards of nurses as well as occupational health and primary care at the worksite with an emphasis on utilization of advanced practice nurses.

To date, two proposals have been submitted in collaboration with the SON to private funding sources (Helene Fuld Foundation and Texas Medical Center). One proposal was accepted and funded with Dr. DeAnna Grimes and Dr. Kay Garcia as Co-PIs. In addition, two projects have been completed related to hospital ergonomics, and one MPH student thesis involved secondary analysis of M. Kay Garcia's doctoral dissertation data related to evaluation of energy expenditure, bending and lifting by specific nursing activity.

3. Students and Graduates

To date, the program has admitted 18 students, graduated 5, and awarded NIOSH traineeships to 11 individuals. During the Fall 1995 semester, there are 4 full-time and 5 part-time students, with one new applicant accepted for Spring 1996. Approximately 5 graduates are anticipated in 1996.

Within the last five years, four students entered doctoral programs after completing the MPH requirement. Two entered the DrPH degree program in occupational health, one entered the PhD program in environmental sciences, and one entered the PhD program in Behavioral Sciences. One additional nurse has successfully completed the qualifying examination and is a candidate for the DrPH degree in the Occupational Health Module.

Program graduates between 1990 and 1995 were:

name	degree	graduated
V. Webber	MPH	May 1991
K. Garcia, MPH	DrPH	August 1993
S. McFarland	MPH	August 1992
L. Norman	MPH	December 1993
B. George	MPH	August 1994
K. Bradley (Disease Control Module)	MPH	August 1994

4. Curriculum

The MPH curriculum for the Program in Occupational Health for Nurses is as follows:

PH 1610	Introduction to Biometry	4	Fall, Spring
PH 2610	Introduction to Epidemiology	4	Fall, Spring
PH 3610	Administration and Public Health I	4	Fall, Spring
PH ____	Behavioral Science Course	3-4	All
PH 6615	Fundamentals of Industrial Hygiene	4	Fall
PH 2175	Principles of Toxicology	3	Fall
PH 6610	Occupational Health	3	Spring
PH 6998	Occupational Safety	1	Spring
PH 6680	Clinical Occupational Medicine	4	Spring
PH 6998	Occupational Health Field Trips	2	Spring
PH 6998	Occupational Health Nursing I	3	Spring
PH 6998	Occupational Health Nursing II-Practicum	1-4	All
PH 9998	Thesis	Vari.	All

Recommended Additional Courses:

PH 6998	Health Promotion in Occupational Settings	1	MWI - Spring
PH 6998	Worker Health Assessment	4	Summer
PH 6650	Employee Assistance Programs in OH	4	Spring
PH 2992	Occupational and Environmental Epidemiology	4	Spring
PH 1720	Introduction to Public Health	4	Spring
	Research Computing		
PH 6998	Occupational Ergonomics	4	Spring
UH 5397	Occupational Health Law		Univ. of Houston

For students pursuing the MSN/MPH option, the requirements are listed below (see next page).

5. Conclusions

The Program in Occupational Health for Nurses continues to develop. Extensive strengthening has occurred in the five year grant period 1990-1995. Increased collaboration with the SON will enhance program efforts. The current program director will leave the program in 1996, and successful faculty recruitment is crucial to success.

**COORDINATED MSN/MPH DEGREE PROGRAM
PUBLIC HEALTH NURSE SPECIALIST WITH OCCUPATIONAL HEALTH FOCUS**

(rev.9/94)

Courses Taught by SON	Credit	Courses Taught by SPH	Credit	Courses Co-taught by SON & SPH	Credit
N 5555/5565/5570 or 5580 Adv. Clinical Nursing I*	4	PH 1610 or PH 1725 Biostatistics	4	PH 1498 or N 5501Y Social and Cultural Concepts for Public Health Practice	3
N 5556/5566/5571 or 5581 Adv. Clinical Nursing II*	4	PH 2610 Epidemiology	4	PH 6998 OHN I	3
N 5557/5567/5572 or 5582 Adv. Clinical Nursing III*	4	PH 3610 Administration & Public Health	4	PH 2498 or N 5534 Y Population and Environmental Assessment	3**
N 5520 Health Assessment/ Advanced Nursing Practice	3	PH 6998 OH Field Trips (elective)	2	PH 4410 or N 5535 Y Health Program Planning	4**
N 55XX Pharmacotherapy	3	PH 6680 Clinical OM	4	PH 9998 or N 5500 Thesis	6
N 5510/5524/5526 or 5527 Advanced Basic Science	5	PH 6610 Occ. Health PH 6615 Fund. of IH PH 2175 Prin. of Toxicology PH 6998 Occ. Safety	3 4 3 1	PH 6998 OHN II, Practicum	4
TOTAL CREDITS	23		29		16-23

TOTAL HOURS

68-75

* Recommended sequences of courses in Advanced Clinical Specialty are in women's health, mental health, oncology, or emergency nursing.

**OHN students may petition for waiver.

III. INDUSTRIAL HYGIENE

1. Background

The Industrial Hygiene program at the School of Public Health of the University of Texas - Houston formally began with the appointment of Professor James Hammond in 1976. The current program director, Dr. Lawrence Whitehead, joined the program in 1986, when Professor Hammond retired. The Industrial Hygiene program faculty consists of two tenured Associate Professors, both Certified Industrial Hygienists, Drs. Lawrence Whitehead and Thomas Stock, and one Assistant Professor Certified Industrial Hygienist faculty member, Dr. Maria Morandi. The admissions demand on the program remains steady, though a substantial proportion of students attend part time, while working.

2. Program Goals and Objectives 1990-1995

The following are the goals set for the grant period 1990-95 in the grant application filed in 1989, and a summary of how well each has been met. The goals are:

- 1. Continue to seek approval for a third tenure-track industrial hygiene faculty position. Our priorities for the area of teaching for this person continue to be ergonomics, safety, and/or industrial ventilation.**

Approval was not obtained for this position during the grant period. Other beneficial positions in occupational health and environmental science held higher priorities, and in fact benefit the IH Program. These include six major faculty commitments in the last five years. (1) Dr. Mary Ann Smith was recruited in toxicology; (2) another faculty search is underway in environmental science, with a focus on human health effects/exposure assessment; (3) a promotion and conversion to full time tenure track was approved for Dr. George Delclos, medical director in occupational medicine; and (4) an additional 50% time faculty member was hired in occupational medicine, Dr. Arch Carson; (5) 50% support was made available for the position of Director of Occupational Health for Nurses, Dr. Kay Garcia; and (6) a new junior occupational medicine faculty member has been hired, Dr. XiFeng Wu. Funds were made available to teach the Hazardous and Solid Waste Management course in 1992, 1993, 1994, and 1995. In addition, despite financial limitations, the administration has committed over \$130,000 to equipment purchases directly supportive of industrial hygiene.

- 2. We will develop a teaching role for research faculty member Maria Morandi, Ph.D.**

This was accomplished. Dr. Morandi has prepared and offered, four times in the last five years, a course in Environmental Exposure Assessment, as well as coordinating other environmental sciences courses. The Environmental Exposure Assessment course is a high level course and is taken by doctoral and strong masters students. This will continue.

3. We will maintain our current participation in the programs of student funding of the American Industrial Hygiene Foundation (AIHF), and the Semiconductor Safety Association (SSA).

This was accomplished. Funding is being awarded this year from the American Industrial Hygiene Association Foundation Fellowship program (\$1000 for the 95-96 year, for one Fellowship). AIHAF funding has been received annually since 1987-88. A student will compete for a Semiconductor Safety Association Scholarship of \$1500 in 1995-96. One or more students have won an SSA scholarship each year since 1992, and in 1990, often placing in the top three in the competition between the papers submitted.

4. We will our maintain current ties with Texas A&M, and seek to develop this further.

This is moot; a site visit team in 1992 disapproved NIOSH funding for the Texas A&M programs in industrial hygiene and safety, which were up to that time part of this ERC. All formal association has ended.

5. We will maintain ties with OH nursing students and occupational medicine students.

This has been done and expanded. IH, nurse, and physician students take several courses together, including the required courses Fundamentals of Industrial Hygiene, Principles of Toxicology, and usually several electives such as Ergonomics, and Occupational Health. The Ergonomics course typically has team projects, with each team including IH students and a nurse or physician. During the course of this grant period, an Occupational Health Field Trips course has been developed and offered yearly. IH students, OH nursing students, and occupational medicine students take this course, in which they prepare reports on each of five to six visits to industrial plants. Each report is from a team which brings together IH, nurse, and physician students and their respective viewpoints and skills, insofar as the numbers of each permit. At a minimum, each IH student is paired with a nurse or a physician. Doctoral students in OH nursing and in industrial hygiene are periodically invited to the Occupational Medicine Journal Club. Plans are being made to include industrial hygiene students in the new and growing occupational medicine clinic. While the mechanics remain to be worked out as of fall 1995, the plan is to have selected IH students prepare IH background information on work details of patients (most of whom are current UT employees). They will be supervised by Dr. Whitehead.

6. We are preparing the groundwork to seek AAIH/ABET/RAC accreditation in the near future.

Application for accreditation has been achieved. The program prepared its program report in July 1995 and was site visited by ABET in October 1995. We await word on approval.

7. We intend to develop at least one CE course to be offered by program faculty during the current year of our existing grant. This will be continued into later years of the grant.

This has been exceeded. IH faculty members participate in courses annually including Indoor Air Quality, Industrial Hygiene for Non-Industrial Hygienists, and Audiometry, and have participated in several custom courses for specific purposes during the grant period reported.

8. We will make use of the numerous institutions in the Texas Medical Center (TMC) for research and student experience.

While not a specific goal in 1990, but a critique from site visitors, the noted need to make use of the TMC as a resource calls for a response regarding progress. Our OM program has had research projects involving several hospitals in the TMC. Doctoral research in ergonomics has been done in two hospitals. Several industrial hygiene masters theses have been conducted in the UT MD Anderson Cancer Center, sponsored by a cross-appointed Associate Professor on our faculty, H. Erle Janssen, Director of Environmental Safety for that institution. Current or former students of our program work in health and safety in four major TMC hospitals, Methodist, Texas Childrens, Herman, and UT MD Anderson Cancer Center. The IH program has conducted a periodic (each three to six months) breakfast meeting on a healthcare worker occupational health topic. This group is called the Houston Healthcare Health and Safety Network. It has met five times as of June 1995. Topics have been Risks and Control Issues for Tuberculosis, Ribavirin Risk and Control, Skin Reactions to Gloves, Infection Control Issues During Construction, Occupational Exposure to Cancer Chemotherapy Drugs, and Needlestick Control. We have developed a mailing list of over 60 names that includes all identifiable healthcare health/safety professionals in the Houston Area. Typically 30 to 35 people attend.

3. Students and Graduates

The training record of this program is strong. Through Spring 1995, a total of 151 graduates have been produced from the industrial hygiene program (see list below for the five year grant period reported on here). Based on the best available information, about one-third work for private primary manufacturing employers, 14% work for consulting companies, 11% work for government, 8% are university faculty, 14% are lost to followup, about 10% are in jobs unrelated to industrial hygiene, or deceased, and the balance are distributed over a number of miscellaneous categories. About half work in Texas. About 40% of graduates are Certified Industrial Hygienists (CIH), and about 7% are Industrial Hygienists in Training (IHIT), through the spring of 1995 American Board of Industrial Hygiene exams. On the average, about 4 to 6 students graduate each year.

Current students average about 30 to 35 each year. Roughly, about 10 are full-time

(usually six are NIOSH trainees) with the balance part-time and/or working on thesis only, and about six are doctoral students. Admissions are usually about five students per year.

All Industrial Hygiene Graduates, 1990 (Summer) - 1995 (Spring)

name	employer	location	yr/mon grad.	degree
Chung, Chih-Wen	UTSPH doctoral student	Houston TX	9008	MS
Cowen, P.E., John S.*	Environeering	Houston TX	9008	MS
Fleming, Janet L.*	J.K. Inc.	Houston TX	9008	MPH
Meraz, LeAnne B.	Consultant	Houston TX	9008	MS
Philpott, Patricia A.	job hunting	California	9008	MS
Haglund, Roberta E.*	Ecology and Environment, Inc.	Houston TX	9105	MS
Havis, David W.	Shell Oil Company	Wood Riv.IL	9108	MS
Weishuhn, Barbara J.*	Environ.Permittng & Compliance	Houston TX	9112	MS
Abdelnoor, Glen D.*	DAP, Inc.	Dayton OH	9205	MS
Dotiwala, Havovi K.*	ATEC Environmental Consultants	Houston TX	9205	MS
Rosas, MS, Alan L.*	City of Houston	Houston TX	9205	PhD
Shields, Joanne W.*	St.of Wash., Dept.Labor & Indust.	Olympia WA	9205	PhD
Metzler, Cheryl Ann	BP Chemicals America	Texas	9208	MS
Hammock, Curtis M.*	City of Houston	Houston TX	9212	MS
Allen, Haskell E.*	Eagle Environmental Health, Inc.	Houston TX	9305	MPH
Ellisor, PE, Parisa	not active	Charleston IL	9305	MS
Philips, Kathy L.*	Eagle Environmental Health	Houston TX	9305	MS
Jaffe, Mary P.*	job hunting	Houston TX	9308	MS
Ajgaonkar, Ashay A.*	EORM, Inc.	San Jose CA	9405	MS
Chin, Kimnie Lee	unknown	San Ant.TX	9405	MPH
Harvey, Caroline H.*	Consultant	DickinsonTX	9405	PhD
Shah, Sushma V.	job hunting	Houston TX	9405	MS
Sheffield, Kevin J.	UT Health Science Center	Houston TX	9405	MPH
Coleman, Seita R.*	JK, Inc.	Houston TX	9408	MS
Frederick, Fanny W.*	Eagle Environmental Health	Houston TX	9408	MS
Kamal, Mustofa	UTSPH PhD student	Houston TX	9505	MS
Saunders, Debra A.	UT MD Anderson Cancer Center	Houston TX	9505	MS

* = NIOSH Trainee

4. Curriculum

The basic requirements in the School of Public Health for a masters degree are 36 credit hours and completion of a masters thesis. Industrial hygiene students will take at least 45 or more credits to meet the course of study. Coursework usually constitutes two academic years for the full-time student. The thesis determines how long a student takes to complete

the degree. Students attending full time, usually NIOSH trainees, will typically seek an internship in the summer between first and second years. Two to four students are typically placed in internships each summer. Nearly all part time students are employed, many in health and safety jobs, so they do not typically take a separate internship. Though the outcome of the ABET industrial hygiene accreditation application process is not known as of this writing, current admission and masters degree requirements include the minimum ABET requirements.

In addition to academic courses, each student will typically have the following field and practical experiences before finishing. Labs (typically 6 to 7) in sampling methods will be taken in the Environmental Sampling and Analysis course. Almost all students take Occupational Ergonomics, which includes an extensive team field project in cooperating industry. All students take the course Occupational Health Field Trips, which includes writing reports on five to six plant visits. Most students either are already employed in occupational safety and health, or take a summer internship in the summer between years. Most IH theses are either field studies (typically in UT or other Texas Medical Center facilities), or laboratory projects. The ground rules of the MPH degree permit administrative topics to be covered in theses (e.g. program design, such as occupational TB screening), while MS theses must be more oriented to a scientific question typically requiring data collection. Most of the MPH theses also fit this latter category. The curriculum is shown on the next page.

5. Conclusions

We believe that the strongest programmatic area in the IH program is that of exposure assessment and related work with epidemiologic studies and other health-effects activities. All three faculty teach in the area of exposure assessment and strategies, and all have worked with epidemiologic studies regarding exposure assessment. Dr. Morandi is a member the EPA Science Advisory Board Committee on Indoor Air and Total Human Exposure Assessment. Dr. Whitehead is a member, American Industrial Hygiene Conference and Exposition (AIHCE) short-course instructor, and session arranger for 1995 and 1996 for the AIHA Exposure Assessment Strategies Committee. Dr. Stock is a member of several community organizations in Houston interested in assessment of environmental pollutant exposure and health effects, including the Houston Environmental Foresight Program (an EPA environmental priorities setting project), the regional Air Quality Planning Committee of the Houston-Galveston Area Council, and the Environmental Health Committee of the ALA. The overlap into community air exposure issues is typical of total environmental exposure assessment, and is appropriate to broadening interests in industrial hygiene today.

The program is very stable, maintains a steady enrollment, is well-received in the job market, and has an experienced and stable faculty. The program was successfully reviewed for a five-year renewal by NIOSH in late 1994, for the period 1995-2000.

INDUSTRIAL HYGIENE & AIR ENVIRONMENT - Course of Study

Master of Science (MS) or Master of Public Health (MPH) Degrees

The University of Texas - Houston, School of Public Health

(F, S, I = Fall or Spring semesters, or Spring or Summer Institute)

Core Courses in Industrial Hygiene & Air Environment

PH 6615 F Fundamentals of Industrial Hygiene (IH I) (4)
PH 6620 S Occupational Health and Safety Evaluation and Control (IH II) (4)
PH 2155 S Environmental Sampling and Analysis (4)
PH 2175 F Principles of Toxicology (3)
PH 2150 F Air Environment (3)
PH 2498 S Special Topics: Industrial Ventilation (3) (alt.yrs.; Spr.1996)
PH 6998 S Occupational Health Field Trips (2)
PH 2498 S Environmental Sciences Seminar (1)
PH 9998 Thesis Research (varies)

Core Courses in Related Areas

PH 1725,1726 F,S Intermediate Biometric Methods I, II (4 ea)
PH 2610 F,S Introduction to Epidemiology (4)
PH 1720 F,S Introduction to Public Health Research Computing (4), or equivalent or prior course work, or experience in introductory microcomputing
MPH ONLY: PH 3610 F,S Administration and Public Health I (4) or equiv.
MPH ONLY: PH 1110 S Social and Behavioral Aspects of Community Health

Elective Advanced or Cognate Courses (minimum nine sem.cr.hrs.; more recommended)

PH 2498 S Environmental Radioactivity and Radiation (3)
PH 6610 S Occupational and Environmental Health (4)
PH 2498 S Special Topics: Occupational Ergonomics (3) (alt.years; Spr.1997)
PH 2177 S Toxicology II: Toxic Agents (3)
PH 6998 F Applied Safety (2)
PH 2498 F Environmental Exposure Assessment (4)
PH 2498 F Hazardous and Solid Waste Management (3)
PH 2499 I Indoor Air Quality (1)
PH 2998 F Occupational Epidemiology (2)
PH 1998 F Introduction to Risk Analysis (2)

Other electives relevant to a student's interests may be taken as additional hours or, by permission of the industrial hygiene faculty, may be counted in the minimum of nine elective credit hours required from the above course group. Examples might include:

PH 2220 S Hydrology I - Groundwater Protection (3)
PH 2215 S Water Supply and Pollution Control (3)
PH 2499 Individual Studies - as needed, subjects vary (1-4)

Core Preparation: 6 hrs. math (calculus recommended); 12 hrs. chemistry including organic chemistry; 6 hrs. biology. Physics, statistics and physiology are recommended. Required General Preparation: a total of at least 120 semester credit hours, including 63 or more semester credit hours in science, mathematics, engineering, and technology, including the above core preparation, with at least 15 hours at the upper (junior, senior, or graduate) level, and a minimum of 21 semester credit hours in communications, humanities, and social sciences. GRE: verbal plus quantitative totaling 1100 or higher is highly desired. 8/95.

IV. INDUSTRIAL HYGIENE and SAFETY ENGINEERING - Texas A&M University

1. Background

The Industrial Hygiene and Safety Engineering (SENG) Programs at Texas A&M University, based in Nuclear Engineering since 1992 and in Industrial Engineering before that date, were part of this ERC until they were disapproved for further NIOSH funding at a site visit in 1992. The last fully funded year was 7/1/92 through 6/30/93, with a small amount of funding in 1993-94 to complete training for students who started in 1992-93. The programs still exist as of this writing, but are no longer part of this ERC. A brief description of each program as they stood in 1992 in the last competing application for these programs is included below.

Both programs are of long standing, but faculty attrition without replacement in the late 1980's and especially the early 1990's caused problems. In summary, this was a time of programmatic coping with very stringent budgets and with a College of Engineering waiting for permanent administrators to arrive. The programs were very hard-pressed to deal with this, and fully occupied in trying to do so.

2. Goals and Objectives

a. Industrial Hygiene

The goals of the Industrial Hygiene program are to continue to develop professionally competent young men and women in the discipline of industrial hygiene. The program is practitioner oriented at the Masters level. This is consistent with other programs offered around the country. The M.S. program in Industrial Hygiene has been stable over the last several years (as of 1992) and increased enrollment has been seen. However, recognizing that the vast majority of graduates are practitioners rather than researchers, and few of them have continued on for the Ph.D., it was decided in 1988 to offer a non-thesis option as well as the thesis option. The primary intent of the non-thesis option was to permit individuals who qualified for the program, and could obtain a one year leave of absence from their employer to obtain the M.S. degree. This option permits the serious student to obtain the degree in 12-15 months, rather than the 18-24 months generally required by students for the thesis program. Through 1992, about 50% of the students had chosen to follow the non-thesis program.

b. Safety Engineering

The principal goal of the Department and the Safety Engineering program is to continue to develop professionally competent young men and women in the discipline of Safety Engineering. At the Master's level, the program is oriented to preparing individuals to be practitioners in the field. This is consistent with other programs offered around the country.

3. Students and Graduates

The listing below indicates where the industrial hygiene graduates over the period 1990-1993 have taken positions (when known):

<u>name</u>	<u>graduation</u>	<u>company</u>	<u>Location</u>
R. Walton	8/90	USAF	Texas
D. Anna	8/91	Amoco	Illinois
J. Martinko	8/91	Conoco	Texas
R. LeBansky	5/91	Texas A&M U.	Texas
D. Plett	12/91		
S. Prawdzik	5/91	USAF	Utah
T. Sullivan	8/91	Chevron	California
K. Dendahl	12/91	Radian Corp.	Tennessee
D. Auirett	12/92	Pantex	Texas
J. Duke	12/92	Intermedics	
R. Duke	12/92		
C. Vickery	8/93	Shell Oil	

Safety program graduates are:

M. Rodriguez	8/90	Ph.D. Pro.	TAMU
J. Costa	8/90	Unknown	Portugal
W. Chanis	8/90	NASA	Florida
S. Neelam	12/90	Unknown	
L. Paris	12/90	SAIC	New Mexico
J. Bowen	12/90	SAIC	New Mexico
A. Narayanan	12/90	Env.Res.Mgmt.Ltd.	India
R. Jeyaseelan	5/91	Ph.D. Pro.	TAMU
S. Merritt	5/91	Ph.D. Pro.	TAMU
M. Doerr	5/91	Ph.D. Pro.	TAMU
G. Cerqueira	8/91	Unknow	Portugal
J. Doreswamy	8/91	Teacher	India
S. Hantman	5/92	IBM	North Carolina
W. Purcell	5/92	Nelson & Associates	Texas
M. Bajwa	12/92	Unknown	
M. Botwin	5/93	Unknown	
K. Mohammed	5/93	Unknown	
M. Shalkowski	8/93	Arthur D. Little	Texas
C. Mendez	8/93	Unknown	
F. Rangel	8/93	Unknown	

In 1991-92, Safety Engineering had ten masters students enrolled, of whom two were

ERC-supported. Industrial hygiene had nine students, of whom seven were NIOSH-supported.

4. Curriculum overview

Master of Science in Industrial Hygiene, or in Safety Engineering, Dept. of Nuclear Engineering, 1992

i. Thesis Option

A thesis option for the Master of Science in Industrial Hygiene, or in Safety Engineering, may be taken. The requirements for this degree may be satisfied by completing a minimum of two full semesters of approved courses and research for a total of 32 semester hours of credit. Individuals anticipating pursuit of a doctorate usually choose the thesis option for their Master of Science degree.

ii. Non-Thesis Option

A non-thesis option for the Master of Science in Industrial Hygiene, or in Safety Engineering, may be taken. The requirements for this degree may be satisfied by completing a minimum of 36 semester hours, of which 18 semester hours must be in the major and a minimum of six (6) semester hours in supporting fields.

A thesis is not required, although four (4) semester hours of Special Problems with a complete technical report is required. Generally, this requires some bench research and the development of original data, although it is possible for the student to develop a special problem during his/her summer internship, if approved by the faculty. A final comprehensive examination is required and no exemptions are allowed. The requirements as to level of courses and examinations are the same as for the thesis option Master of Science degree.

5. Conclusions

Programs at Texas A&M University in Industrial Hygiene and in Safety Engineering were part of the SWCOEH through 1992-93, with a closeout year in 1993-94. These programs continue to operate successfully without NIOSH funds.

V. CENTER ADMINISTRATION

The Southwest Center for Occupational & Environmental Health (SWCOEH) is located in The University of Texas Houston Health Science Center in the School of Public Health. It is a research and training center within the School of Public Health, located on the tenth floor of the Reuel A. Stallones Building. The Center incorporates faculty and students from a variety of disciplines related to occupational and environmental health. The Center Administration is responsible for the administrative and management support for the core

programs in Industrial Hygiene, Occupational Medicine, Occupational Health for Nurses and Continuing Education/Outreach. All of these activities are housed in the Houston campus of The University of Texas School of Public Health, although activities of these programs reach far beyond Houston and the Texas Medical Center.

The main goal of center administration is to provide the infrastructure for the NIOSH Educational Resource Center and to facilitate the activities of the core programs and the continuing education and outreach programs. In addition, center administration acts as a catalyst to promote interdisciplinary activities and the development of center goals. It is incumbent upon center administration to coordinate and negotiate additional resources, especially personnel, to provide a complete range of support for the NIOSH ERC programs. This has become an increasingly important objective of the Center in the face of continual reduction of funding for personnel from the NIOSH training grant, and from state funding.

1. Organization

The Center Administration is comprised of the office of the Center Director, Deputy Center Director and Assistant Center Director. The Deputy Director supports Center Administration activities and acts on the Director's behalf in his absence or upon his request. The daily management and administration of the Center is the primary responsibility of the Assistant Center Director, with input as necessary from the Center Director and Deputy Director. The activities of all programs are coordinated through the Center Administration, which also includes a capable support staff of administrative, secretarial and computer support personnel.

1. Center Director

The Center Director reports directly to the Dean of the School of Public Health. He is responsible for providing leadership and direction for all Center activities. Lawrence W. Whitehead, PhD, CIH, was named Interim Center Director in November 1991, upon the resignation of Patricia A. Buffler, PhD, and Center Director in 1995. Dr. Buffler left The University of Texas to become the Dean of the School of Public Health at the University of California at Berkeley. Dr. Whitehead was the Deputy Director of the Center through 1991, and continues as Director of the Industrial Hygiene program.

2. Deputy Director

George L. Delclos, MD, MPH, was named Deputy Director when Dr. Whitehead was named Interim Center Director. Dr. Delclos directs the Occupational Medicine program and the WHO Collaborating Center for Occupational Health. His responsibilities to Center Administration include participating in Center Administration meetings, representing the Center Director in his absence or upon his request, and providing leadership and support to Center Administration and development.

3. Assistant Center Director

Sarah A. Felknor, MS, was hired as Center Coordinator in May 1990, and the position title was later changed to Assistant Center Director to reflect the level of responsibility and activity of this position. The Assistant Center Director is responsible for the daily operation and management of the Center, for providing liaison with The University of Texas administration and other outside agencies, coordinating research activities and grant development, providing support for both faculty and staff development, and serves as a focal point for Center development activities. The Assistant Center Director is also responsible for coordinating the preparation of all NIOSH applications and for providing liaison with NIOSH personnel as needed.

4. Steering Committee

The Steering Committee was established to advise and assist the Center Director and Center Administration. Activities of the committee include the formulation of Center policies and procedures; development and support of an interdisciplinary approach to Center operation; assist with the development and evaluation of outreach and continuing education activities; and consideration of routine management issues as they arise.

The Center Steering Committee is made up of the following members: Center Director, Deputy Director, Assistant Center Director, Industrial Hygiene Director, Occupational Medicine Director, Occupational Health for Nurses Director and Continuing Education Director. The convener of the Occupational Health Module of the School is invited to all meetings. The Steering Committee meets monthly. Beginning in fall 1995, the Steering Committee and the Occupational Health faculty meet jointly, except for strictly Center management activities.

5. Board of Advisors

The Board of Advisors was revived and re-developed following a two-year period of limited activity from 1990 to 1992. Dr. Buffler began the much needed revitalization of the Board of Advisors with the assistance of outside consultants and advisors prior to her departure from The University of Texas. A newly revised board had not been formed prior to January 1992. Dr. Whitehead coordinated the development of a new Board of Advisors and sought the leadership of Kenneth G. Gould, MD, Director of Health Services for Exxon Company, USA, who agreed to serve as Chairman of the Board. Effective June 1995, Sharon D'Orsie was named Chair of the Advisory Board. Under the leadership of Dr. D'Orsie the Advisory Board has already seen significant changes in the leadership and makeup of the board, as well as proactive and positive interaction with the School of Public Health Dean and administration. A broad-based, interdisciplinary membership was recruited to assist the Center Director and Program Directors in the development and evaluation of Center programs and activities.

2. Center Goals and Objectives

The mission of the Southwest Center for Occupational and Environmental Health is to promote health, safety and well being in the workplace and the community. That mission statement is the focal point of our overall goal to continue to develop academic and research expertise in occupational and environmental health in the region by providing excellent graduate and continuing education, and by conducting relevant research in the disciplines associated with occupational and environmental health. In spite of significant changes in the leadership of the Center and two of the three academic core programs and continuing education during the 1990 -1995 period, we have made great progress and have been able to address each of the goals identified in 1990.

1. Goals for 1990 - 1995

The following goals were established for the five year period covering 1990 through 1995. Progress made to date follows each goal statement.

a. Assemble dedicated and capable Center administration personnel and Program Directors, faculty and personnel. The Center Administration is represented by the Center Director, Deputy Center Director and Assistant Center Director. Together these individuals provide leadership and support for the development and implementation of Center activities. They are joined by an excellent faculty who are responsible for directing and carrying out the program activities.

Patricia A. Buffler, PhD, was Center Director of The University of Texas ERC from 1988 through November 1991. Lawrence W. Whitehead, PhD, CIH, Associate Professor of Environmental Health, was named Interim Center Director in November 1991 and permanent director in 1995.

George L. Delclos, MD, MPH, Associate Professor of Occupational Health, was named Deputy Director in January 1992. The Deputy Director is responsible for participating in Center Administration and representing the Center Director in his absence or upon his request. Dr. Delclos has also been responsible for developing the research interests of the Center and contributing to the focus of Center Outreach activities.

Sarah A. Felknor, MS, was hired as Center Coordinator in May 1990. The position was renamed to Assistant Center Director to reflect the additional duties and activities that Ms. Felknor assumed. Ms. Felknor holds a Master of Science degree from American University in Organizational Development and has designed and managed public health assistance programs in developing countries for 20 years. She came to the SWCOEH from the Center for Health Promotion Research and Development (CHPRD) in The University of Texas School of Public Health where she was responsible for managing special and international programs. She is an organizational specialist with a background in public health, and has provided great leadership of the organizational and development activities of the

Center.

Lawrence W. Whitehead, PhD, CIH, Associate Professor of Environmental Health, has been the Director of the Industrial Hygiene Program since 1986, which has enjoyed a strong reputation due to its long history of excellent students and over 150 program graduates. Dr. Whitehead serves on over 30 student committees. Dr. Whitehead has been able to draw upon the skills and knowledge of Maria Morandi, PhD and Thomas Stock, PhD, CIH, who provide critical support to the IH Program in the areas of air quality, exposure assessment, indoor environmental quality and analytical methods.

M. Kay Garcia, RN, MSN, DrPH, Assistant Professor of Occupational Health, was named Acting Director of the Occupational Health for Nurses Program when the former director Mary E. Nickolaus, DrPH, left The University of Texas in 1991. Upon completion of her doctorate in public health, Dr. Garcia was appointed Assistant Professor, non-tenure track and named Director of the OHN Program with 50% state funding. Dr. Garcia was previously Director of Continuing Education, and in that capacity, she was responsible for organizing, developing and improving the previously failing CE Program. Dr. Garcia has shown the same leadership abilities in the OHN Program where she has developed the course offerings and academic requirements for OHN students, as well as participated in the development of a joint MSN/MPH degree offering with the School of Public Health and School of Nursing.

Candace Pardue, MEd was hired as the Director of Continuing Education in December 1994 to replace Pamela D. Parker, MEd. Ms. Parker was hired in January, 1992, as the Director of Continuing Education to fill the position vacated by Dr. Garcia when she became Acting Director of the OHN Program. Ms. Parker has a master of education degree in adult education and program development. Ms. Pardue holds a master of education degree, and was the Director of Continuing Medical Education at the University of Texas Medical Branch in Galveston prior to joining the SW Center.

b. Strengthen existing and expand Center collaborative efforts with the School of Public Health, University of Texas Health Science Center, the Texas Medical Center, Texas A&M University, the University of Houston, and other academic institutions in the region. With the disbanding of the Office of Continuing Education for The University of Texas Health Science Center, the NIOSH CE Program has had a key role to play in the development of the future of School of Public Health continuing education activities. This has increased awareness of the ERC CE program and provided opportunities for further collaboration. The School of Public Health arranged a sabbatical "loan" of Sharon Cooper, PhD, Assistant Professor of Epidemiology, from the Center to the University of Houston Health Law and Policy Institute where Dr. Cooper was Co-Principal Investigator of a state funded review of *Occupational Injury and Illness in Texas*. The Center contributed significant portions of the report and cosponsored a national workshop on occupational injury and illness with the University of Houston, at which time the report was released to the public. Additional collaborative efforts within the Texas Medical Center include the

development of networks of employee and occupational health professionals which were spear-headed by Center faculty. These networks include the Association of Hospital Employee Health Programs (AHEHP) and the Houston Healthcare Occupational Health and Safety Network.

Center research initiatives in occupational health of healthcare workers have provided great opportunities for additional outreach and collaborative activities with various institutions within the Texas Medical Center, including The University of Texas Medical School, Hermann Hospital, Texas Children's Hospital, LBJ General Hospital, among others. Center faculty have also been very active in the successful development of a strong collaborative relationship with The University of Texas Student and Employee Health Clinic, Nursing School and Medical School. Center faculty provide medical consultation, and organizational advice to the Clinic, which also serves as a rotation site for NIOSH students. Additionally, there have been collaborative research efforts in ergonomics with the Industrial Engineering Department at the University of Houston.

c. Strengthen and increase interdisciplinary, outreach, education and research activities within the Center and in the region. In 1990 the Center began to broaden the scope of the NIOSH ERC to include the disciplines of occupational and environmental epidemiology. This increased scope was reflected in the name change of the Center for Occupational Safety and Health to the *Center for Occupational & Environmental Health*. The expanded activities of the Center included the work of Dr. Buffler prior to her departure in occupational epidemiology, and participation of Sharon Cooper, PhD, Assistant Professor of Epidemiology, in teaching and research projects. Dr. Cooper's background in occupational and environmental epidemiology provides a depth to the interdisciplinary nature of the Center. Anne Sweeney, PhD, Assistant Professor of Epidemiology, recently joined the Center faculty. Her research in environmental epidemiology, particularly as it relates to reproductive health effects, and teaching also provide strength to the environmental health aspects of Center activities.

Sarah A. Felknor, MS, has been an active investigator of occupational health issues of healthcare workers. She has been, and is, Co-Principal Investigator with Dr. George L. Delclos in the following NIOSH/ERC, Inc. funded activities: *Selection and Evaluation Criteria for Sharps Containers; Effectiveness of Hospital-Wide Needleless System Use; Evaluation Criteria for Anti-Needlestick Devices; and Compliance Factors Associate with Universal Precautions (subcontract with Johns Hopkins University)*. She was also co-investigator of a CDC Cooperative Agreement with the Ramsey Foundation investigating the circumstances of percutaneous injury among hospital-based healthcare workers. Ms. Felknor and Dr. Delclos have several grant applications pending which propose to further investigate the occupational health issues of healthcare workers.

There has been tremendous improvement and continued development of both the content and number of continuing education course offerings over the 1990 to 1995 period. The NIOSH faculty, as well as outside experts, have contributed to program offerings. Under

the leadership of Dr. Garcia, Ms. Parker, and Ms. Pardue, the CE Program has developed a reputation for the interdisciplinary nature and quality of its programs. The Center faculty have also participated in the development of a formal outreach plan, specializing in occupational health aspects of healthcare workers. T

he Center is located in the Texas Medical Center, which boasts over 40 healthcare-related institutions and over 60,000 healthcare workers, students, and volunteers, that provide both opportunity and need for outreach activities. See the Continuing Education and Outreach program reports for more information on these accomplishments and activities.

d. Develop liaisons with regional industries to assure provision of field and clinical sites. The Occupational Medicine Program has maintained its excellent relations with regional industries which provide rotation sites for the OM residents. Likewise, the Industrial Hygiene Program coordinates summer internships in local industry for students, and OHN students are able to choose clinical rotations from an outstanding list of preceptors. All of these activities are based in workplaces and increase the awareness of the NIOSH Center as well as contribute to the training of occupational health professionals.

e. Develop a responsive, viable, formal continuing education function. Please see section c. above and the Continuing Education detailed program description for an in-depth description of the successful accomplishments of the CE Program during the 1990 to 1995 period.

f. Continue to maintain and expand the excellent library resources in occupational health and safety and assemble catalog audio-visual training resources. The University of Texas School of Public Health maintains excellent library facilities. In addition, the Center faculty maintain a library on the tenth floor of the School of Public Health where historical as well as current journals and texts are available for use by students and other faculty. These include an extensive collection of NIOSH publications. The concept of a catalog of audio-visual training resources library has been discussed at considerable length by the NIOSH CE Directors and was not feasible. However, the Center through the School of Public Health continues to provide excellent library resources and has been able to purchase the CC INFO CD-ROM disk set for the School of Public Health library annually for several years, which is available on-line.

g. Improve the quality of existing programs and provide for an increase in the number of students. This report speaks to the success of our efforts in developing the quality of our core programs, with the notable exception of the loss of the Safety Engineering and Industrial Hygiene programs at Texas A&M University. During a 1992 site visit during which the Safety Engineering and Industrial Hygiene Engineering programs were up for competitive renewal, the NIOSH site visit team disapproved these two programs and funding was not renewed. However, the Houston campus programs of Industrial Hygiene (Public Health), Occupational Medicine, Occupational Health for Nurses, and Continuing Education have developed and improved over the last five program years. Please see each program's detailed description for more information.

h. Expand outreach efforts in the region. See the Outreach Program description for a review of these efforts.

i. Offer MPH and DrPH degree programs in occupational health for nurses. The MPH degree has been offered in the OHN Program with five graduates to date. In addition, two students entered the DRPH program in occupational health for nurses in the last five years without any NIOSH support.

j. Explore the opportunity for the development of cooperative programs with other advanced degree programs with a major focus in occupational health and safety. In addition to the joint MSN/MPH degree program with The University of Texas School of Nursing, we offer elective rotations with other advanced degree programs including The University of Texas Medical School and have initiated a joint residency program with Baylor College of Medicine.

k. Research Training: Develop core research training initiatives, farm and agricultural worker program, and occupational injury program. The 1994 application for the period 1995-2000 included requests for support of research training in all three academic cores of industrial hygiene, occupational medicine and occupational health for nurses. OM and IH were approved. Research training has been particularly successful under the direction of Dr. George Delclos and Ms. Sarah Felknor in the area of occupational health concerns of healthcare workers. These research projects, funded by the NIOSH/ERC, Inc. cooperative agreement have provided opportunities for several students to participate in all aspects of research development, implementation and evaluation. Additional research activities which have involved occupational health students include hospital ergonomics, energy expenditure, shiftwork, and respiratory hazards among healthcare workers.

Under the direction of Mary E. Nickolaus, DrPH, the Center submitted a farm worker safety program grant to NIOSH which was approved but not funded. Dr. Sharon Cooper has taken the lead in occupational injury and published an excellent review of *Occupational Injury and Illness in Texas* while she was on leave to the University of Houston and with support from the faculty and staff of the Center. Dr. Cooper has just concluded a study of *Cancer in Texas* with an emphasis on occupational exposure. Both of these occupational studies involved masters and doctoral students in the School of Public Health and provided research training opportunities. Dr. Cooper and Drs. Arch Carson and Michal Tamuz have designed a track in occupational health in the public health aspects of workplace safety, which has been approved by the faculty of the occupational health module.

l. Develop a plan to evaluate activities of the Center and individual programs. In 1991 Dr. Buffler acquired the assistance of a consultant from UC Berkeley to evaluate the Center and provide an assessment of the strengths and weaknesses of the Center in terms of its organization and administration. Those needs have been addressed in both form and content with the development of a well qualified Center Administration and an effective organizational structure. Under the leadership of Ms. Sarah Felknor the Center maintains its

commitment to continually assess and evaluate the progress of the Center in terms of its mission, goals and supporting activities. This has become an ongoing process. The Board of Advisors also supports this process by advising the Center faculty and program directors on the form and content of the NIOSH programs.

2. Goals for 1995 - 2000

The last application submitted in July 1994, included a list of overall Center objectives for the Year 2000. Although significant progress has been made on many of these objectives, they remain a central focus of our activities for the next five years. The goals are as follows:

- 1. Develop a clearly stated mission.*
- 2. Develop and strong identity.*
- 3. Develop a multi-disciplinary Center.*
- 4. Develop and strong educational and research programs.*
- 5. Active in community service.*
- 6. Develop a strong resource base.*
- 7. Develop international activities.*

3. Institutional Support

The University of Texas Houston Health Science Center and the School of Public Health place a high priority on the issues relating to occupational and environmental health. This commitment to occupational health has been made apparent by the additional support that the Health Science Center has made available to the School of Public Health during the last two academic years. This additional funding provided full state salary support for an additional half-time occupational medicine physician (Arch "Chip" Carson, Md,PhD), 50% state salary support for M. Kay Garcia, RN, DrPH as Director of the Occupational Health for Nurses program, and the recruiting of XiFeng Wu, MD, PhD, in occupational medicine in fall 1995. Additional state funds have been committed to fully support the junior occupational medicine physician now being recruited.

The University also committed funds to occupational health by supporting the development of The Student and Employee Health Clinic, which is an interdisciplinary clinic that relies heavily on the participation of Center faculty in the disciplines of occupational medicine, occupational health nursing and industrial hygiene.

In addition to continued salary support of faculty, the School of Public Health commits 50% salary support for the Assistant Center Director, Sarah A. Felknor, MS and has continued to help us look for additional sources of support for the Director of Continuing Education in as the NIOSH support has diminished. The School of Public Health also contributes to the remaining salary support needed for all secretarial and other support personnel listed in the NIOSH application.

The Dean and the administration of the School of Public Health have given the Center every consideration of requests and have been very supportive of our efforts to re-group and develop a new identity and future for the Center after the departure of Dr. Buffler as Center Director. The School continues to provide excellent facilities and space to support our educational and research programs, and has been willing to work with us to resolve the many demands our active continuing education program sometimes places on limited resources and space.

Overall and specifically, The University of Texas Houston Health Science Center and the School of Public Health have provided support of our activities and a commitment, both financial and resource-based, to the continued development of the NIOSH Educational Resource Center.

D. External Support

In spite of continual reduction in NIOSH funding for support staff personnel related to the NIOSH ERC, NIOSH funding remains a critical source of for support personnel, administrative and secretarial. These funds have provided key support for these functions. We have also been able to negotiate increased support from the School of Public Health for both short-term and long-term shortfalls in personnel funds. The Training Related Expenses of the center administration budget are a key source of support for this NIOSH ERC.

We continue to have success in receiving other awards for training and research activities. Dr. George L. Delclos and Ms. Sarah A. Felknor were awarded in 1995 a five year international training grant from the NIH Fogarty Center in occupational and environmental health. This training program is supported in part by funds from NIEHS and NIOSH. It will provide tuition and stipend support for the MS and PhD programs in epidemiology, environmental science and safety. This training grant represents a collaborative effort with the University of Houston Department of Engineering, where the safety training will be provided. In addition to the Houston-based academic training, the grant includes in-country continuing education and worker training in occupational health.

In addition, the NIOSH/ERC, Inc. cooperative agreement provided a total of three new grants during the last round of funding opportunities. These grants are focused mainly on identifying patterns of injury and evaluating the impact of safety devices in hospital settings. In addition, user satisfaction and its relation to device use is being studied. Unfortunately, the NIOSH/ERC, Inc. Cooperative Agreement was not renewed in 1995 and we view this as a disappointing loss of federal funds. Since 1991, we have received a total of six grants and one subcontract under the NIOSH/ERC, Inc. grant program totaling over \$470,000 in direct funds.

E. Interdisciplinary Activities

This year the Center has directed more attention to expanding the participation of

faculty and representation of disciplines in the SWCOEH Steering Committee and other activities. To this end, we have recently suggested combining the monthly Steering Committee meetings with the occupational health module faculty meetings to facilitate better communication and interaction among these faculty. The first meeting took place on November 1, 1995 and we will need more time to evaluate this approach to increased interdisciplinary activity.

F. Conclusions

Center Administration continues to provide a sound base for NIOSH and other educational and research activities. A well trained core of support personnel and physical facilities make this an excellent site for education, research and outreach. Our proximity to the Texas Medical Center also provides a unique venue for investigation and teaching. Under stable leadership with capable faculty who are productive in the academic and research community, the NIOSH ERC received in fall 1994 the highest site visit rating since its inception in 1977. The outreach activities of the Center were acknowledged to be outstanding and the academic programs strong, with the exception of the Occupational Health for Nurses program due to having only faculty member who was not tenure track, and lacking expanded institutional support for future recruitment. Well trained students graduate from these programs, in addition to the continuing education courses, who serve the occupational health needs of the community at large.

VI. CONTINUING EDUCATION

1. Background

The Continuing Education Program has continued to evolve during this five year grant period. In 1990, Ms. Kay Garcia was Continuing Education Director, followed in 1992 by Ms. Pam Parker. In November, 1994, Ms. Candace Pardue was appointed to the position. Despite this turnover, the Program has continued to maintain the momentum initiated by Ms. Garcia. For example, the concept of a "continuing education institute" (a week of several CE courses offered during the same period) was developed by Ms. Garcia and was continued and expanded by Ms. Parker and Ms. Pardue. The projected "1996 Spring Institute" will actually be the 9th annual institute conducted by the SWCOEH.

2. Goals and Progress

Goals during this period included: (1) developing new markets for courses and expanding the number of course titles offered, (2) continuing with needs assessment activity, (3) developing more regional offerings, (4) participating with the Health Science Center Continuing Education Task Force Committee, and (5) building relationships with outside organizations. These goals were met in the following ways:

Item (1): The projected number of course titles in goal statements previous to 1990

was 12. However, by 1993-1994, the number of individual course titles actually offered was 25, with attendance of 971. In 1994-1995, the number of individual course titles offered was 20, with attendance of 1145.

Item (2): The most consistent type of needs assessment used during this period was direct feedback provided by participant evaluation forms. Another type of needs assessment included collaboration with local organizations and groups, such as the Texas State Association of Occupational Health Nurses (TSAOHN), the Louisiana Occupational Health Nurses Association, the Gulf Coast Chapter of the AIHA, and the American College of Occupational and Environmental Medicine (ACOEM). Early during this period, an extensive telephone and mailing survey was conducted among industrial hygienists, safety engineers, occupational medicine physicians, and occupational health nurses in Texas, Oklahoma, Arkansas, New Mexico, and Louisiana. Approximately 400 individuals were contacted by telephone and approximately 6000 surveys were mailed.

Item (3): The Program has routinely provided courses in a variety of locations-- Dallas, New Orleans, Baton Rouge, Houston, Santa Fe, Little Rock, San Antonio, Oklahoma City, Austin, Tulsa, Albuquerque, Corpus Christi, El Paso, Laredo, and Harlingen.

Item (4): Ms. Parker served on the Health Science Center Continuing Education Task Force Committee which made recommendations to the office of the Vice President for Academic Affairs. The recommendations were accepted with minor modifications. The reviewers felt that the overall goal of continuing education was appropriate with the mission of the Health Science Center, and that a CE committee be established, composed of individuals in the individual Health Science Center units responsible for CE. This CE committee has been established in 1995, with Ms. Pardue and Dr. Whitehead representing the SWCOEH.

Item (5): The CE program has continued to build relationships with outside organizations. The Texas State Association of Occupational Health Nurses (TSAOHN) contracts with the SWCOEH CE program to handle specific CE details for their annual conferences. Ms. Pardue has been invited to join the Gulf Coast Chapter AIHA Education Committee, and routinely participates in their planning committee meetings. The partnership with Occupational Marketing Inc., (OMI) continued to grow as additional sessions were offered in new locations. Ms. Pardue has been approved as a Joint Sponsorship Committee member to jointly sponsor continuing medical education programs with the American College of Occupational and Environmental Medicine (ACOEM).

3. Courses and Attendees

Occupational Medicine: The occupational medicine faculty continued to be very active in planning and supporting, with instructional time, many course titles. These titles include "Pulmonary Function Testing Training," "CAOHC Audiometric Certification Training," "Introduction to Environmental Health," "Border Environmental Health Education

Program," "Health and Safety for Embalmers," "TSAOHN Annual Conference," "Occupational Medicine Case Studies," "SMA Occupational Medicine Workshop," and "Employee Risks and Hazards."

Occupational Nursing: The following course titles have been conducted: "COHN Examination Review," "Critical Incident Stress Debriefing," "Introduction to Occupational Health Nursing," "Pulmonary Function Testing Training," "CAOHC Certification Training," and "TSAOHN Annual Conference."

Industrial Hygiene: The following course titles were offered: "Comprehensive Industrial Hygiene Review Course," "Indoor Air Quality," "Air Sampling Strategies," "Personal Protective Equipment," "Industrial Hygiene for Non-Industrial Hygienists," "NORM (Naturally Occurring Radioactive Materials)," "Advanced Industrial Ventilation," and "Industrial Hygiene-Current Topics."

Occupational Safety: The following course titles were offered: "Employee Risks and Hazards: Hospital Design Issues," "Occupational Safety: Related Ergonomic Issues," "Office Ergonomics," "Occupational Safety in Industry," and "Health and Safety for Embalmers."

Interdisciplinary: The following course titles were offered: "Disability Management," "Preventing Workplace Violence," "Introductory Workplace Ergonomics," "Applied Workplace Ergonomics," "Managing Employee Health Programs," "Ergonomics for Manager/Supervisors," "Clean Air Act Amendments," and "Cumulative Trauma Disorders: Practical and Legal Concerns."

Number of attendees:

1990-1991	483
1991-1992	1097
1992-1993	1215
1993-1994	971
1994-1995	1145

4. Conclusions

The Continuing Education Program has had three different Directors during this grant period, 1990-1995, but has continued to move forward in number of courses offered and number of attendees. Eight annual "CE Institutes" have been conducted with the ninth institute planned for 1996. New courses have been developed in response to audience needs, and existing courses have been revised/modified. Different types of needs assessment methods have been tried. Relationships with outside organizations have been developed. In summary, the Continuing Education Program has offered quality courses in a variety of subject areas, in a variety of locations, receiving consistently positive feedback. The Program

will continue to be responsive to the needs of health and safety professionals in the region.

VII. OUTREACH PROGRAM

SWCOEH Outreach Program - General outreach activities have been conducted and will be continued by each core program in the areas of educational development, presentations/lectures, consultation and other areas. In addition, the Center Steering Committee has identified the occupational health issues of healthcare workers (HCWs) as a specific focus of our outreach program, as well as an externally funded research interest. Specific efforts to address this outreach theme are discussed in each program's outreach report.

Initial Center-wide activities include the organization of the Houston Healthcare Occupational Health and Safety Network (HHN). Details may be found in the Industrial Hygiene Program report under Program Goals. As of June 1995 the HHN has met five times to focus on HCW health and safety. Two programs per year of the HHN will be developed by Center faculty and will be targeted toward management and other groups not currently involved in the network.

Center faculty have had a key role in the development of the Houston chapter of the Association of Hospital Employee Health Programs and the newly-established Texas Medical Center health and safety group. In addition to providing speakers for network meetings, Center faculty assist the network members with a variety of academic, program planning and administrative issues surrounding the overall goal of improved health and safety environments for area healthcare workers.

Continuing Education - The CE Director served as a task force member on the UTHSC president's task force for continuing education. The group met for approximately nine months and examined continuing education at the Health Science center. Recommendations were made and forwarded to the president's advisory committee. Information from that group was related earlier in this document.

The CE director also contributed a chapter to the "Occupational Illness and Injury" report funded by the state legislature through University of Houston. The chapter included statistical information regarding the numbers and types of programs offered in the state of Texas. In addition, it listed the agencies and institutions providing CE for occupational health and safety professionals.

Other outreach activities included consulting with TSAOHN and TOMA concerning their program activity and providing faculty to speak at several association meetings. Numerous inquiries from previous course participants were also answered. Other activities ranged from locating print resources, to finding other training sources, to referrals for content expertise questions. These activities will be continued.

Occupational Medicine - At the local level, the OM Program will target two objectives:

a) to focus on the SWCOEH emphasis area of occupational hazards of healthcare workers, by continuing to strengthen ties and acting as a resource to the hospital occupational health community. This will be achieved through the different networks that SWCOEH has been instrumental in developing, namely the Occupational Health and Safety Network, the Houston chapter of the Association of Hospital Employee Health Programs and a recently established Texas Medical Center health and safety group. Specific activities will include presentations and seminars, participation in the education committees, problem-solving sessions and administrative structures of these networks, and by acting as consultants to the various Texas Medical Center and other greater Houston area hospitals;

b) to impact the medical school and postgraduate (residency) curriculum content in occupational and environmental health by achieving greater visibility of the OM faculty at both medical schools through development of more elective rotation opportunities, combined training programs, preceptorships and a greater number of formal lectures and seminars.

At the regional level, the OM Program will continue to assist the following schools in the development of their respective occupational medicine programs:

a) University of Texas Health Science Center at Tyler - (provision of the academic year component of their occupational medicine residency; elective rotations)

b) University of Texas School of Public Health - San Antonio and El Paso campuses - (curriculum development; periodic lecturing)

c) Texas Tech University, at Lubbock - (curriculum development; possible postgraduate training program in occupational medicine)

At the international level, the OM Program will continue to participate and expand its contribution in the areas of consultation, teaching and collaborative research, primarily in Latin America, through the SWCOEH-based World Health Organization Collaborating Centre in Occupational Health.

Occupational Health Nursing - The outreach goal for the Program in Occupational Health for Nurses is to promote interest and increase awareness among other institutions, agencies, or groups regarding hazards in the workplace, with an emphasis on healthcare workers and especially nurses.

Objectives

1. Educational Development - Assist schools or other groups / organizations both within and outside the University of Texas Houston Health Science Center with development of occupational health and safety content and curricula, emphasizing the role of occupational health nursing.

a. Continue to work with the University of Texas SON undergraduate and graduate programs regarding occupational health and safety needs of nurses.

b. Select one additional nursing school or other appropriate academic institution every 1-2 years for outreach related to occupational health and safety of healthcare workers, with an emphasis on nurses.

2. Presentations/Lectures/Awareness Seminars - Provide presentations, papers, lectures, awareness seminars to professional or non-professional audiences regarding occupational health and safety, emphasizing the role of occupational health nursing.

a. Invited speaker, TSAOHN conference, Corpus Christi, Spring 1995.

b. Provide at least three presentations per year to appropriate audiences regarding occupational health and safety needs of healthcare workers.

3. Consultation - Consult with industry, state or local trade associations, labor unions, hospitals or other public groups regarding occupational health and safety issues.

a. Pursue opportunities to consult with architectural and design groups regarding the ergonomic design of healthcare facilities.

b. Collaborate with at least one hospital per year regarding occupational health and safety needs of employees.

4. Other - Provide outreach to groups with little or no training in occupational health and safety, emphasizing the role of occupational health nursing as opportunities arise.

Industrial Hygiene - The outreach goals for the IH program are to: (1) continue general outreach; (2) devote particular attention to educational outreach to other academic programs in IH and Safety, specifically offering input at Sam Houston State College and San Jacinto College where contacts are already made; and (3) to pursue the Center objective of outreach in the healthcare industry. With respect to goal (3), the first objective will be to continue coordination and development of the Houston Healthcare Occupational Health and Safety Network (HHN). The third objective will include at least one specific program topic to be developed each year for presentation at the HHN, and such topics will be made available for presentation to other groups such as outlying hospitals or healthcare management groups.

Conclusions

The SWCOEH outreach program has been active throughout the grant period, and in the last two years has added a particular focus on health care workers health and safety activities in addition to general outreach.

**REPORT DOCUMENTATION
PAGE**

1. REPORT NO.

2.

PB97-113724



4. Title and Subtitle The Southwest Center for Occupational and Environmental Health, Final Performance Report

5. Report Date

1996/05/00

6.

7. Author(s) Whitehead, L. W.

8. Performing Organization Rept. No.

9. Performing Organization Name and Address School of Public Health, University of Texas - Houston Health Science Center, Houston, Texas

10. Project/Task/Work Unit No.

11. Contract (C) or Grant(G) No.

(C)

(G) T42-CCT-610417

12. Sponsoring Organization Name and Address

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words) Academic training has been provided by the Southwest Center for Occupational and Environmental Health in Houston, Texas in the areas of industrial hygiene, occupational health for nurses, occupational medicine, and safety engineering and hazardous substance training. Courses were offered in theory and practice in the specialties, and joint course work was included in occupational and environmental health, along with the principle disciplines of public health including epidemiology, biostatistics, behavioral sciences, and management and policy sciences. The continuing education program and outreach program of the center offered courses in a five state region to those practicing in the field of occupational health along with professionals in related disciplines, paraprofessionals and technicians. Focus has also been expanding in the areas of infection control, ergonomics, and industrial hygiene. Grants and stipends available for participants in the program were discussed. The strongest program in the industrial health division was that of exposure assessment and related work with epidemiologic studies and other health effects activities.

17. Document Analysis a. Descriptors

b. Identifiers/Open-Ended Terms NIOSH-Publication, NIOSH-Grant, Grant-Number-T42-CCT-610417, Grant-Number-T42-OH-07085, End-Date-06-30-1995, Training, Occupational-health-programs, Industrial-hygiene, Education, Occupational-health-nursing, Occupational-medicine

c. COSATI Field/Group

18. Availability Statement

19. Security Class (This Report)

21. No. of Pages

42

22. Security Class (This Page)

22. Price

