

**Rocky Mountain Center
For
Occupational
And
Environmental Health
Salt Lake City, Utah 84112**

September 2002

Final Performance Report

7/1/2000 - 6/30/2002

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CENTER ADMINISTRATION

ABSTRACT and OVERVIEW

The Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) was established in 1977 in the Department of Family and Preventive Medicine (DFPM), at the University of Utah School of Medicine. The Center was established to provide occupational and environmental health and safety (OEHS) graduate and continuing education programs, to conduct OEHS research, and accomplish relevant service activities. In 1978, the RMCOEH was designated a National Institute for Occupational Safety and Health (NIOSH) Educational Resource Center (ERC—designation subsequently changed to Education and Research Center) and has continued to be supported by NIOSH since the initial award. This report summarizes activities during the July 2000-June 2002 grant period.

Throughout the grant period, the Center provided education, research, and service programs in the three disciplines of Occupational Medicine (OM), Industrial Hygiene (IH), and Ergonomics and Safety (E&S). In addition to these program areas, the Center has a dynamic Continuing Education (CE) program, with offerings in all three core areas. Center faculty have also presented academic and continuing education courses in Hazardous Substances (HSAT and HST, respectively). In July, 2001, NIOSH funding was received for an Occupational Injury Prevention Research Training program, with Ph.D. students admitted to the program in 2001. During the two grant years, over 70 students were enrolled in academic programs and over 4,000 students attended 165 CE programs. An additional 442 students attended HST programs. During this grant period, Center faculty submitted a total of 59 research and other proposals, with over \$2,227,000 awarded by June, 2002. Faculty also had 61 publications submitted or published.

The members of the Center's very active Advisory Committee, complemented by professionals in RMCOEH program-specific advisory committees, have regularly evaluated RMCOEH activities. The Advisory Committees' inputs; faculty interactions with senior OEHS professionals in this and other countries; results of surveys of academic graduates; extensive needs assessments; and discussions with industry, labor, and legislative members have helped assure the Center's programs are relevant and current.

The administration section, created at the time the Center was established, had specific goals and objectives for the five years of the grant period in the same manner as each of the program areas. The remainder of this section summarizes progress in achieving the administration's goals and objectives. Progress in accomplishing the goals and objectives of the other programs is provided in the following program sections.

SIGNIFICANT FINDINGS

The following is a summary of progress in accomplishing the overall goals for the Center Administration for the 2000-2002 grant period. Details regarding progress in achieving the specific objectives related to each goal are provided in the next section.

Goal 1: Provide proactive administrative support to enable faculty to present exceptional OEHS graduate and continuing education programs.

Results: Accomplished. During the grant period, 72 students were enrolled in RMCOEH academic programs and the CE program had over 4,000 registrants for its courses. A total of 165 CE programs were presented during the grant period. As discussed in detail under Objective 1.a., surveys of graduates of academic programs in 2001 documented the quality and effectiveness of the education programs, with particularly high rankings given by those graduating recently. Similar ratings were achieved for CE programs. Administration members worked with Dr. Hegmann, OM director, to develop funding necessary to hire an additional faculty member. That individual joined the faculty in July, 2001.

Goal 2. Provide administrative support needed to enable faculty to design and accomplish research studies that focus on National Occupational Research Agenda (NORA)priority areas.

Results: Accomplished. During 2000, faculty met to develop a Center Research Plan. The plan was completed on 25 July 2000. As a result of these efforts, the numbers of research proposals and awards increased significantly. Twenty-three research proposals were submitted in FY 2001, compared to twelve in FY 2000. As discussed in Objective 2.a., RMCOEH research now focuses on NORA priority areas.

Goal 3. Assist faculty in providing services that protect and enhance the health and safety of workers, their families, and those exposed to environments impacted by work activities.

Results. Accomplished. Since 1999, two IH faculty, one E&S faculty, and one OM faculty have joined the Center. This expansion of faculty has permitted expansion of Center service activities. Members have provided support to state agencies, including the Utah Department of Health, Utah Department of Environmental Quality, and the Utah Labor Commission. Support has consisted of consultation, provision of short courses, and development of educational modules. Faculty have also provided support to local government organizations as well as to numerous private businesses and corporations. The efforts have focused on approaches to reducing workplace or environmental hazards in order to maintain or improve health and safety.

Goal 4. Provide administrative support to programs and activities that will maintain and expand the Center's Interdisciplinary foci and collaboration in accomplishing education, research, and service.

Results. Accomplished. At the RMCOEH strategic planning meetings in July 2000 and April 2001, members reviewed all aspects of the Center's programs in order to define methods of expanding interdisciplinary activities. In addition to the required interdisciplinary academic class sessions, regular sessions have been scheduled during lunch with faculty and students of all cores attending. An adjunct faculty member discusses his or her OEHS activities during the session. These sessions have emphasized Occupational Health Nursing (OHN) principles and practice to compensate for the fact that funding for the

OHN program was discontinued in 2000. Other informal interdisciplinary sessions provide excellent opportunities for the students to get to know each other and their interests and capabilities.

Goal 5. Implement the DFPM Ph.D. in Public Health

Results. Partially accomplished. After a number of years, the Ph.D. program in Public Health, was approved by the University and Board of Regents. It is approved for implementation as soon as funding is secured. Faculty submitted a proposal to NIOSH for funding of a Ph.D. in Public Health, Occupational Health and Safety emphasis, but this was not approved. A proposal for a Ph.D. in Occupational Injury Prevention was funded in 2001. Faculty continue to work with other Public Health program faculty to obtain support for funding of the Ph.D. in Public Health.

BODY OF REPORT WITH CONCLUSIONS

As indicated in the Summary of Significant Findings section, five goals were established for the RMCOEH administration. Specific objectives were established for each goal. The following details the progress in accomplishing these objective.

Goal 1: Provide proactive administrative support to enable faculty to present exceptional OEHS graduate and continuing education programs.

Objective 1.a. Assure appropriate utilization of advisory committees.

Results. Accomplished. The Center Advisory Committee met twice in 2000 and twice in 2001. It met once in 2002 and is scheduled for a second meeting in October, 2002. A new format was implemented during the grant period whereby individual advisory committee member meet in break-out sessions with the program director and faculty of a program that reflects the member's expertise. These sessions are accomplished during the early portion of the meeting, immediately after a Center overview and update. The members then rejoin to discuss activities and needs of the programs. This process results in much more focused inputs and recommendations by Committee members, and it has expedited review and decisions by the full Advisory Committee. The mission and composition of the Advisory Committee, as well as minutes of the last two meetings, are provided in Appendix ADM-1 In addition to the Advisory Committee meetings, RMCOEH Program Directors (Executive Committee) meet formally on a monthly basis to accomplish on-going management of RMCOEH activities and to respond to Advisory Committee recommendations.

Objective 1.b. Complete the survey of graduates of RMCOEH academic programs.

Results: Accomplished. A survey was mailed to all RMCOEH academic graduates in March, 2001, and a follow-up mailing was accomplished in July. Results are provided in Table ADM-1. Of note are the high ratings accorded by those who have graduated since 1995, when faculty initiated a comprehensive review of the academic courses. Graduates reported significant cost savings, as noted in Table ADM-1. Although the amounts of reported savings as a result of OEHS programs cannot be analyzed or accurately quantified, the amounts listed indicate that the programs can have major benefits for the corporations as well as for the workers and their families.

Objective 1.c. Provide direction and support for development of innovative educational approaches.

Results: Accomplished. The Center's initial correspondence course, "Management of Occupational Health and Safety Programs," was revised to reflect publication of the second edition of the text, *Effective Management of Occupational and Environmental Health and Safety Programs--A Practical Guide*. The revised course, "Practical Aspects of Management", was approved for increases in credit to 40 AMA Category 1 hours, 5.0 ABIH credits, and 4.0 CEU's. An on-line version of the course was produced in 2001 (located at the Center's web site, www.rmcoeh.utah.edu). Additionally, the American Board of Preventive Medicine approved the course as a recertification module for specialists in occupational medicine, general preventive medicine and public health, and aerospace medicine.

An innovative approach to classroom teaching is the use of digital recordings of worksite activities to enhance academic presentations to students. These efforts have resulted in increased interest and response by the students.

The CE program continued to expand offerings with 165 programs offered during the grant period. Over 4,000 professionals registered for the CE courses.

Faculty received funding from the Utah Labor Commission to develop an internet-based self-study program to improve the health and safety of telecommuters and others working at home. This program was completed at the end of the grant period and is available through the CE program.

Finally, Dr. Moser completed the education module, "Bioterrorism Responses by Health Professionals". The module includes a Power Point presentation, script for the presentation, pre- and post-test, and a patient handout. The module was prepared under auspices of the Association of Occupational and Environmental Clinics and NIOSH under Cooperative Agreement U60/CCU317613.

Objective 1.d. Assist in developing and implementing plans to maintain and expand the number of RMCOEH faculty.

Results. Accomplished. In 1999, two IH (Dr. Stephenson and Mr. DeRosso) and one E&S (Dr. Seseck) full-time faculty members were added to the Center's faculty. Dr. Suruda, former OM program director, changed to part-time status in July, 2001. At that time, Dr. Hegmann became OM program director and deputy Center director. Edward Holmes, M.D., MPH joined the OM faculty in July, 2001. At the end of the grant period, plans were in place to hire another OM faculty member to begin in July 2003. Table ADM-2 provides a summary of RMCOEH faculty.

Objective 1.e. Monitor numbers of minority students with the objective of increasing minority student enrollment in MSPH and MPH programs.

Results: Partially Accomplished. Minority applications and admissions are tracked at both the Department and Center levels. During the grant period, 14 minority students were admitted to RMCOEH academic programs. In addition, over 160 minority students enrolled in CE courses. (It should be noted that provision of ethnic information is voluntary and some CE participants do not provide a response.) The fact that Salt Lake City and its surroundings has a very limited ethnic population continues to hamper our efforts to recruit minority students.

Objective 1.f. Improve CE facilities.

Results: Partially Accomplished. A new University Guest House has been constructed in close proximity to the Rocky Mountain Center. This facility has conference rooms that provide excellent settings for CE programs. Center Administration has requested space in a new medical school facility that is in final planning stages. However, it is not clear when work will begin on the facility.

Goal 2. Provide administrative support needed to enable faculty to design and accomplish research studies that focus on NORA priority areas.

Objective 2a. Encourage research directly related to NORA priority areas.

Results: Accomplished. Recent RMCOEH efforts and proposals have focused on the following NORA priority areas: Exposure Assessment, Low Back Disorders, Musculo-Skeletal Disorders of the Upper Extremity, Traumatic Injuries, Risk Assessment Methods, Social and Economic Consequences of Workplace

Illnesses and Injuries, Intervention Effectiveness, Special Populations at Risk, and Organization of Work. The Pilot Project Research Training (PPRT) Management Committee established award criteria that give preference to proposals addressing one or more NORA priority areas. Recently funded projects include "Airborne Exposure Assessment of Abrasive Blasting Aerosol Copper," "Young Worker Fatal Injury in Construction" (NIOSH), "Assessment of the Effectiveness of Personal Protective Equipment and Decontamination Procedures" (OSHA), "Exposure Monitoring Using Direct Reading Instrumentation" (OSHA), "Development of an Ergonomic Analysis Survey Tool" (UAW), "Use of Carbotrap Collection Methods and Gas Chromatography/Mass Spectroscopy to Finger-Print Odors" (DFPM Bishop Award), and "Impact of Shift Length on Error Rates in Hospital Personnel" (DFPM.) Essentially all RMCOEH research has been directed to NORA priority areas.

Appendix ADM-2 provides a bibliography of RMCOEH publications for the grant period. As noted in the Appendix, faculty had over 60 items published or submitted, and a number had student authors.

Objective 2b. Obtain funding to support research training and enhancement of research expertise of junior faculty.

Results. Accomplished. E&S and IH junior faculty have received research support through the Pilot Project Research Training program. The desired outcome of each pilot project is a formal research proposal for extramural funding. In addition to the PPRT awards, an IH junior faculty member (Mr. DeRosso) received the \$25,000 DFPM Marian Bishop research award to characterize and fingerprint odors emanating from workplaces. Junior faculty have also received \$20,628 from the DFPM Health Studies fund that is specifically designed to assist faculty in developing research expertise. Dr. Stephenson, IH, received RO3 funding from NIOSH for his study of in-vitro mordenite fiber dissolution at acidic pH. Junior faculty have participated in faculty research sessions that have focused on grant sources and methods to submit competitive applications.

Objective 2.c. Continue to explore potentials for joint research programs and efforts with other academic institutions.

Results. Accomplished. A follow-on evaluation of upper extremity disorders, supported by the Ford Motor Company and the United Auto Workers, will again involve the University of South Florida. Dr. Stephenson's study mentioned in the prior paragraph involved consultants from Lovelace, NM. The PPRT grants have involved investigators from the Training Program Grant institutions of Montana Tech and Colorado State Universities. Another PPRT project included faculty of the Department of Chemical and Fuels Engineering, College of Engineering, University of Utah.

Goal 3. Assist faculty in providing services that protect and enhance the health and safety of workers, their families, and those exposed to environments impacted by work activities.

Results. Accomplished. The internet-based course to maintain and improve the health and safety of those working at home will directly benefit these workers. The course is structured to provide information that will also be applicable to other family members, including infants.

Faculty and CE members continue to provide services and support to numerous government, commercial, and private organizations in the Intermountain West. Activities include provision of short courses, consultations, student support to accomplish projects, and investigations. As only one example, IH faculty

conducted exposure assessments for the EPA at the site of a train derailment with chlorine gas release and the possible production of dioxin and other contaminants. Appendix ADM-3 provides a listing of the more than 500 organizations who have been assisted by the RMCOEH during the grant period.

Goal 4. Provide administrative support to programs and activities that will maintain and expand the Center's interdisciplinary foci and collaboration in accomplishing education, research, and service.

Objective 4.a. Provide administrative support to strengthen the Center's strong interdisciplinary orientation in all areas.

Results. Accomplished. The RMCOEH faculty have continued to emphasize interdisciplinary interactions in all areas. This area was considered extensively during the RMCOEH faculty Retreat and Strategic Planning session in July, 2000, during subsequent Executive Committee/Program Directors' meetings, and again at the April, 2001 Strategic Planning retreat. During the review of interdisciplinary interactions, it became apparent that the extensive interactions in class work were not matched by a similar level of interactions in other areas. Consequently, orientation and other non-didactic sessions and social activities have been added. In 2001-2002, a program of one-hour luncheon sessions was added. An OEHS professional presents a summary of his or her activities, emphasizing the importance of team approaches in meeting current and future challenges in the field. With the cessation of the OHN program, particular emphasis has been placed on having OHN adjunct faculty present at these sessions. The overall emphasis has been on interdisciplinary course work complemented by non-didactic interchanges. Table ADM-3 provide summary documentation of interdisciplinary activities.

Objective 4.b. Assist Center faculty in expanding local, regional, and national collaboration with government, industries, and professional organizations.

Results. Accomplished. Many of the organizations that receive support from the Rocky Mountain Center also serve as collaborators on projects and grants. Appendix ADM-4 provides a partial listing of such collaborators. Experience has repeatedly demonstrated that collaborations directly enhance the Center's programs as they result in interactions with those facing "real world", and often urgent, OEHS challenges. In particular, the interactions provide excellent opportunities for students to gain experience with actual OEHS needs and activities.

Goal 5. Implement the DFPM Ph.D. in Public Health

Objective 5.a.: Work with DFPM and University officials to designate the Ph.D. in Public Health as a top priority of the University for legislative funding.

Results. Partially accomplished. After a number of years of effort, the Ph.D. in Public Health was approved by all required University Reviewers and by the Utah Board of Regents. It received strong support from the Department and Health Sciences Center and was designated as one of the University's top 3 funding priorities for one legislative session. Unfortunately, it was not funded at that time. Efforts to elevate it to a top priority for subsequent sessions have been unsuccessful.

Objective 5.b.: Explore alternative funding for the Ph.D. program.

Results. Partially accomplished. OM and E&S faculty submitted a proposal for an Occupational Injury

Prevention Ph.D. program. The proposal was funded by NIOSH in 2001. An E&S proposal for a Ph.D. in E&S was approved by NIOSH in 2002. RMCOEH faculty continue to work with George White, Ph.D., director of the Department's Public Health Programs, to support funding of a Ph.D. program, which would be open to IH students, through reallocation of University course income.

CONCLUSION:

Four of the five goals of Administration were accomplished, and the remaining goal was partly accomplished. Of the 13 objectives developed in support of the goals, 9 were accomplished and 4 were partially accomplished. Administration assisted RMCOEH faculty in increasing the number of faculty, expanding research activities, increasing distance learning and outreach activities, and increasing the number of professional publications. The following is a summary of the results of the Centers activities during the grant period:

Number of students enrolled in academic programs:	72
Number of students graduated from academic programs:	33
Number of publications submitted or published.	61
Number of research proposals submitted:	32
Amounts of research awards:	\$273,000
Number of other proposals submitted:	27
Amounts of other awards:	\$1,954,000

With these results, the Center is poised to maintain its leadership role in occupational and environmental health and safety.

The following sections describe the activities of each program. Listings of numbers of students enrolled, graduates, and graduate work locations are provided. (In accordance with University policy, names of students or graduates are not provided in public documents.)

**Table ADM-1
2001 RMCOEH GRADUATE SURVEY RESULTS**

(119 Respondents = 47%)

I. Overall Ratings of RMCOEH Graduate Education Programs:		
	Graduating Prior to 1996	Graduating 1996 or later
Excellent	37%	50%
Very Good	56%	50%
Adequate	7%	0
Marginal	0	0

II. Current Employer:	
Industry/Hospital	41%
Federal Government	18%
State Government	8%
Local Government	2%
University	12%
Own Business	5%
Consultant	6%
Other	8%

III. Current Time in OEHS Activities	
Full Time	67%
Part Time	21%
No OEHS Work	12%

IV. Reported Impacts of Implemented OEHS Programs:	
Financial:	\$10,000 - \$100 million (Majority in \$100,000 to \$3,000,000 range)
Other:	Improved morale Feeling safe Improved efficiency

TABLE ADM-2
FULL-TIME FACULTY
ACADEMIC COURSE RESPONSIBILITIES, AND AREAS OF EXPERTISE

Donald S. Bloswick, PhD, PE	E&S Program Director; Course director, <i>Advanced Ergonomics and Occupational Biomechanics, Systems Safety, and Advanced Ergonomics and Occupational Biomechanics Laboratory</i> ; lecturer in multiple RMCOEH courses; member of student advisory committees. National reputation in ergonomics and safety.
Frank DeRosso, MSPH, CIH	Industrial Hygiene Instructor; Primary responsibility for academic courses <i>Advanced IH</i> and <i>Advanced Hazardous Substances</i> ; Course director and major contributor to many CE courses. Student advisor; student research committees.
Kurt Timothy Hegmann, MD, MPH	OM Program Director; OM Residency Director; Director, Occupational Health Clinic; Course director, <i>Occupational and Environmental Diseases, Occupational and Environmental Health Clinic</i> , and lecturer in multiple RMCOEH courses. Extensive research experience, broad clinical expertise, national reputation in occupational and environmental medicine.
Edward Holmes, MD, MPH	OM Clinic Director. Course director, <i>Applied Environmental Physiology, and Occupational Diseases</i> . Extensive clinical experience in Occupational settings.
Dean R. Lillquist, PhD, CIH	Assistant IH Program Director; Course director, <i>Fundamentals of Industrial Hygiene, Advanced Hazardous Substances, and Introduction to Industrial Toxicology</i> ; lecture in multiple RMCOEH courses; member of student advisory committees. National reputation in industrial hygiene with special expertise in toxicology.
Royce Moser, Jr., MD, MPH	Center Director; Course director, <i>Advanced Topics in Occupational and Environmental Medicine, Occupational Medicine Seminar, Health Care Administration (Occupational and Environmental Health and Safety)</i> ; lecturer in other RMCOEH courses; member of student advisory committees. International reputation in occupational, environmental, and aerospace medicine, including program management.
Richard F. Sesek, PhD, MPH	Research Assistant Professor. Course director, <i>Human Factors Engineering, Ergonomics and ME, and Industrial Safety</i> . Areas of expertise are Ergonomics and Industrial safety with specialization in cognitive and perceptual ergonomics.
Dale Jay Stephenson, PhD, CIH	Instructor; primary academic course responsibility for <i>Occupational Safety & Health, and Noise and other physical Agents</i> ; Course director and major contributor to many CE courses. Student advisor; study research committees.

PART-TIME REGULAR FACULTY	
Anthony J. Suruda	Lecturer in RMCOEH Courses, Principal Investigator on research studies, recognized nationally as authority in occupational and environmental medicine.
Victor E. Archer, MD	Lecturer in RMCOEH courses; nationally recognized for research studies of health effects of radiation exposure, including exposure of former uranium miners.

Table ADM-3

Overview of RMCOEH Interdisciplinary Activities

Course:	IH	OM	E&S	IH/HSAT
FPMD 6100 Biostat	X	X	X	X
FPMD 6300 Epid	X	X	MPH	X
FPMD 6400 OEHS Management Group Exercises	X X	X X	MPH MPH	X X
FPMD 6500 Public Health	X	X	MPH	X
FPMD 6501 Seminar in PH	X	X	MPH	X
FPMD 6600 Social Context	X	X	MPH	X
FPMD 6700 Environ. Health Problems	X	X	MPH	X
FPMD 6701 Environ. Phys. Interdiscip. Group Presentations	X X	X X		X X
FPMD 6741 OSH Interdiscip. Seminar	X	X	X	X
FPMD 6750 Fundamentals of OSH	X	X	X	X
FPMD 6752 Occ. Tox.	X	X		X
FPMD 6753 Ventilation	X	E	X Or	X
FPMD 6754 Noise and Physical Agents	X	E	X	X
FPMD 6790 OSH Interdiscip. Field Trips	X	X	X	X
ME6100 Ergo	X	E	X	X
ME6110 Indust. Safety	X	E	X	X

Overview of RMCOEH Interdisciplinary Activities

(Continued)

ME 7105 Advanced Ergo	X		X	X
Interdiscip. Group Exer.	X		X	X
ME 7110 System Safety	X		X	X
Interdiscip. Group Exer.	X		X	X
FPMD 6758 OM Clinic	X	X	X	X
Other:				
Half-day Orientation	X	X	X	X
Comprehensive Examination (4 days group work, ½ day presenting to Interdisciplinary Faculty)	X	X	MPH	X
Special Field Trips (e.g. Tooele)	X	X	X	X
OHN Lunch Sessions	X	X	X	X
Theses, Research Committees with Interdiscip. faculty	X	X	X	X
Interdisciplinary Recreation	X	X	X	X

CENTER ADMINISTRATION
APPENDICES

Appendix ADM-1

**ROCKY MOUNTAIN CENTER FOR OCCUPATIONAL
AND ENVIRONMENTAL HEALTH (RMCOEH)
ADVISORY COMMITTEE MISSION STATEMENT**

(Adopted 15 April 1997)

The mission of the Rocky Mountain Center for Occupational and Environmental Health's Advisory Committee is to:

Review and evaluate RMCOEH programs and functions

Advise on content, scope, and relevance of activities

Serve as an Advisory Board for all NIOSH Educational Resource Center activities

The Advisory Committee performs these functions in order to improve the ability of RMCOEH to enhance the health and safety of workers, their families, and those in environments affected by work activities.

RMCOEH Advisory Committee
June 2002

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**Rocky Mountain Center for Occupational & Environmental Health
Advisory Committee Minutes
October 18, 2001**

The meeting was called to order at 12:30 PM in the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) conference room by Chairman Don Marano. The following people were in attendance:

Committee Members:

Don Marano, CIH, PE
Jay Bagley, MS
William Brady, M.D.
Bob Curtis, MS, CIH
Dennis V Lloyd
Sharon L Morris

Dianne R. Nielson, Ph.D.
Robert Parenti, MA
J. Michael Taylor, CIH
Connie Kirkpatrick, MSPH, COHNS
Robert Ziegler

Chair, President, IHI Environmental
UOSHA Administrator, Utah Labor Commission
Vice Pres for Medical Affairs, Hanford Site Medical Director
Director, OSHA Health Response Team
Senior V.P., General Counsel, Workers Compensation Fund
Asst Chair for Community Outreach, Dept of Enviro Health, Washington State University
Executive Director, Dept. of Environmental Quality
President, Utah Safety Council
Manager of Health & Environmental Issues, LDS Church
O.C. Tanner Corporation
IHI Environmental

Participants

Don Blowski, PhD
Connie Crandall, MBA
Kurt Hegmann, MD
Edward Holmes, MD, MPH
Roanna, Keough
Dean Lillquist, PhD
Royce Moser, Jr., MD
Michael Rigdon, PhD
Dale Stephenson, PhD
Daeyong Hong, DrPH
Deanne Clegg

Program Director, Ergonomics & Safety
Program Director, Continuing Education
Instructor, Occupational Medicine
Clinic Director, Occupational Medicine
Administrative Assistant, RMCOEH
Program Director, Industrial Hygiene
Center Director, RMCOEH
Director of Academic Affairs, DFPM
Assistant Professor, Industrial Hygiene
Visiting Scholar, Gyeongsang National Univ, Korea
Executive Secretary, RMCOEH

Excused:

Roy Buchan, DrPH, CIH
Mark Anderson, M.D.
Ed Mayne

Professor, Industrial Hygiene, Colorado State University
Work Care Industrial Clinic
President, Utah State AFL/CIO

1. Mr. Don Marano thanked everyone for their presence and welcomed new committee member, William Brady, M.D., a 1996 graduate from our Occupational Medicine program. Dr. Brady currently works as Vice President for Medical Affairs and Hanford Site Medical Director at the Hanford Environmental Health Foundation, in Richland, Washington.
2. Mr. Marano went over the agenda. He noted a change in the agenda as Dr. Lillquist and Dr. Blowski would both need to be excused shortly to teach a class and would return later. They will be giving their site visit presentations prior to the center update.
3. Dr. Moser gave a Center update to the committee. (See attached copy of overheads). He noted that Dr. Blowski received an Injury Prevention Award through NIOSH with funding for Ph.D.

The Pilot Project Research Awards are doing well. Last year four awards were given, and this year four awards were given (see attached listing of all awards.) The PPRT awards have ranged from \$4000 - 16,000 given to junior faculty to fund research projects. NIOSH supports this program but, this year, has added a new requirement. All proposals must be reviewed by the Institutional Review Board (IRB), whether they have human subjects or not. This takes more time and may require an extended due date.

An Interdisciplinary Interactions chart (attached) shows the broad range of courses offered to OEH students in all cores. Emphasis is on both classroom and out-of-classroom interactions.

Dr. Moser noted the increase in publications from years past to the present - 30 submissions this year to date. (See attached charts.) He provided a graduate survey update noting a 47% response rate. 100% of those graduating after 1996 rated their program as "excellent" or "very good". (See attached chart.)

As we no longer have an Occupational Health Nursing program, interdisciplinary activities, courses, and field trips are being held to expose students to Occupational Health Nursing principles and practice by experienced Occupational Health Nurses. (See attached handouts of OHN support background, letters of support, and recent activities.)

Dr. Moser expressed appreciation to the Advisory Committee for their help and suggestions in the preparation of our NIOSH grant submission. He noted that the committee's input contributed significantly to the final submission of 1097 pages. He also appreciates the number of committee members who have committed to attend the meeting/lunch with site reviewers on November 5th.

A note of interest is that Dr. Moser's article "Preparing for Expected Bioterrorism Attacks" was published in *Military Medicine*, May 2001.

4. The program directors each gave five minute presentations that will be presented to the site reviewers at the Site Visit. The following comments were made prior to and following a 30 minute breakout session with committee members to discuss presentations.

Industrial Hygiene - Dr. Dean Lillquist, Program Director. (Committee members: Dale Stephenson, Mike Taylor, Jay Bagley.)

Dr. Lillquist gave an update since the grant submission and addressed prior critiques in his slides. It was suggested that the updates on IH research focus on the relationship of regional issues with NIOSH objectives. It should also be emphasized that numbers of grant requests are up, the awards are up and EPA dollars are up.

IH faculty has undergone a transition where their time and emphasis has been put into developing research. Many CE teaching responsibilities have been given to IH adjunct faculty. This has worked out well for CE in having available a broad range of teachers and allowing more time for IH faculty to devote to research projects.

Ergonomics and Safety - Dr. Don Bloswick, Program Director. Committee members: Rich Seseck, Bob Curtis, Dennis Lloyd

Dr. Bloswick gave an update since the grant submission and addressed critiques. He noted that the Ph.D. program was funded; however, the Masters program was not. It has made it difficult in that he has to find other ways to fund the masters program so he will have candidates for the Ph.D. program. On the advice of Committee Members, he will ask NIOSH why the masters program was not funded. Dr. Bloswick also noted that full time faculty was a critique in the 1999 review even though Dr. Seseck was a full time faculty member at that time. He wants to emphasize that both he and Dr. Seseck devote 100% of their time to teaching in the Ergonomics and Safety program and that Dr. Seseck does not teach in any other program. He feels the site visitors have misunderstood the extent of their involvement. Dr. Seseck is not tenure track which seems to be an important factor to NIOSH.

Strengths of the E&S program include increased course offerings and a strong research program. They have excellent interdisciplinary interaction as their faculty lectures in all cores. They have a strong relationship with industry and state government. Dr. Bloswick noted that the Advisory Committee consists of people who hold high levels of responsibility and represent the state and region well. These people serve as a great support to our programs and students.

A challenge in the E&S program continues to be in recruiting minority and ethnic students. It is difficult to find students that can qualify for the engineering program. There is a need for more women in the engineering field. Dr. Bloswick and Dr. Seseck say they are not ignoring this problem and continue to look for ways to seek out these students.

Continuing Education - Ms. Connie Crandall, Program Director. Committee members: Sharon Morris, Robert Zigler, Robert Parenti

Ms. Crandall focused on the progress they have made in offering new courses since the last grant submission. Members of the new CE advisory committee are very strategic people in the community who have worked hard on strengthening CE's presentations. They have been very helpful in identifying training needs. Ms. Crandall especially noted the advances they have made with online training which was a prior critique. They have increased the number of online courses they offer and feel they have made good progress in meeting the challenges of distance learning. It was suggested that CE emphasize the positive by showing the "numbers" of increased courses, who in the community is attending, and identify the new topics that have given them a leading edge in the training field.

Occupational Medicine - Dr. Kurt Hegmann, Program Director. Committee members: Edward Holmes, William Brady, Connie Kirkpatrick

Dr. Hegmann gave an update on progress since the last grant which includes bringing on Dr. Holmes and expansion of the clinic. Dr. Hegmann noted that a past critique in Occupational Medicine was the academic start date. This is a difficult problem since it is a fiscal issue and there is not a clear way of resolving the problems associated with it. Adjunct faculty is a real strength to the OM program, and it was suggested they note how many they have.

Dr. Hegmann notes that interdisciplinary interactions is a strength to the OM program. It provides projects that many times work into publications and presentations that are utilized further. As a result, web sites are developed and information is more accessible. These interdisciplinary chains of events are a strong point of the Center. Teaching efforts are increased with better courses (as proved through evaluations). The clinic also involves other disciplines (IH and E&S) which works out really well. The OM clinic program is growing and patient base is increasing. They are developing a relationship with a network of other clinics.

Administration - Dr. Royce Moser, Jr., Center Director. Committee members: Don Marano, Dianne Nielsen

Dr. Moser gave an update of Center activities since the last grant. He noted the increase in research, publications and interdisciplinary interactions. A lot of interdisciplinary effort has been involved in implementing the Occupational Health Nursing emphasis in all the cores. Dr. Moser expressed appreciation to Connie Kilpatrick who has helped so much with OHN orientation for our students.

There is superb attendance at the Advisory Committee meetings. We have very senior people that give their time to strengthening the Rocky Mountain Center. As a result, we provide excellent outreach to the state and region. We are recognized as a cooperative research source and a support to the community. Evidence of Institution support is high. The University has given us adequate space by providing us our own building. The Department of Family and Preventive medicine, of which we are part, provides the Center 24% state funding while they received receive only 9% state funding.

In the past, our weakness was in research, but that is not the case anymore. Our major weakness continues to be limited funding. Outside funding in this region is difficult because industry concentrations and population are low in a large geographic area. Funding is low from the State and NIOSH funding has been cut due to inflation. Small funding increases have been granted to ERC's; the amount available must be divided between 16 ERCs. Our programs would flourish with increased funding.

5. The Advisory Committee discussed ways they could better prepare for the site visit. Mr. Marano suggested that each committee member have a good understanding of the strengths and weaknesses of the program area they represent. Critiques are sometimes misunderstandings that need to be clarified.
6. The next Advisory Committee meeting was tentatively scheduled for April 24, 2002.
7. The meeting was adjourned at 4:30 p.m.

Rocky Mountain Center for Occupational & Environmental Health
Advisory Committee Minutes
April 24, 2002

The meeting was called to order at 12:40 PM in the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) conference room by Chairman Don Marano. The following people were in attendance:

Committee Members:

Don Marano, CIH, PE
Dennis V Lloyd
Sharon L Morris
Dianne R. Nielson, Ph.D.
Robert Parenti, MA
J. Michael Taylor, CIH
Connie Kirkpatrick, MSPH, COHNS

Chair, President, IHI Environmental
Senior V.P., General Counsel, Workers Compensation Fund
Community Outreach, Dept of Enviro Health, Wash State Univ
Executive Director, Dept. of Environmental Quality
President, Utah Safety Council
Manager of Health & Environmental Issues, LDS Church
O.C. Tanner Corporation

Participants

Royce Moser, Jr., MD
Don Bloswick, PhD
Connie Crandall, MBA
Frank DeRosso, MSPH
Kurt Hegmann, MD
Edward Holmes, MD, MPH
Dean Lillquist, PhD
Roanna, Keough
Deanne Clegg

Center Director, RMCOEH
Program Director, Ergonomics & Safety
Program Director, Continuing Education
Industrial Hygiene, Instructor
Instructor, Occupational Medicine
Clinic Director, Occupational Medicine
Program Director, Industrial Hygiene
Administrative Assistant, RMCOEH
Executive Secretary, RMCOEH

Excused:

Roy Buchan, DrPH, CIH
Mark Anderson, M.D.
Ed Mayne
William Brady, M.D.
Charles Brokopp, Dr.P.H.
Michael Rigdon, Ph.D.
Bob Curtis, MS, CIH
Ed Mayne

Professor, Industrial Hygiene, Colorado State University
Work Care Industrial Clinic
President, Utah State AFL/CIO
Hanford Site Medical Director
Director, State Div of Epidemiology and Laboratory Services
Vice Chair of Academic Affairs, DFPM
Director, OSHA Health Response Team
President, Utah State AFL/CIO, and State Senator

1. Mr. Don Marano welcomed the committee and asked if there were any more items to be added to the agenda. He then turned the time over to Dr. Moser for the Center update.
2. Dr. Moser thanked the Advisory Committee for their attendance and noted the importance of the Advisory Committee's representation at the Site Visit. The Site Visit Report stated:

"Equally impressive was the Advisory Board to the ERC. A State Senator and Labor Leader, a Director of the State Worker Compensation Fund, and the head of the State of Utah Environmental Quality were just some of the members who were impressive and strong advocates of the ERC."
3. Dr. Moser noted that all programs were recommended for five years approval. The E&S Ph.D.

stated in their report they felt the application was “well and conveniently developed” and that the site visit was an “exceptionally well-orchestrated visit.” Dr. Moser thanked faculty, staff, and the Committee for their help in making the application and site visit such a success. Ms. Morris complimented the faculty on their willingness to not only listen to the advice of the Advisory Committee regarding the critiques but then implementing the necessary changes that would improve the application.

4. Dr. Moser attended the National ERC Directors’ meeting where he learned there is potential for new funds and increased flexibility for NORA research. All directors stressed the need for flexibility in use of the funds to avoid another Pilot Project Research Training “mess”. He noted the White House is currently involved in selecting a new NIOSH Director.
5. Ms. Morris gave a brief history of the Washington State Dept of Environmental Health, explaining their funding sources through the State and the Self Insured Employers Fund that has brought significant funding to their program. Ms. Morris said they have had funding since 1963 and it has been a healthy situation because of Fund’s investments in the stock market. However, with the stock market no longer doing well, the Fund has used up their reserves and the University’s funding is being closely scrutinized.

Dr. Moser expressed interest in Ms. Morris’ report as the Center is working with Workers Compensation Fund representative Dennis Lloyd and State Labor Commissioner Ellertson in developing a proposal that could bring the Center significant funding. On 17 December 2001, Dr. Moser met with Commissioner Ellertson and presented a proposal to earmark 0.05% of every 0.5% reduction in Workers Compensation premiums as funding for RMCOEH. Commissioner Ellertson presented the proposal to the Labor Commission Advisory Committee that afternoon. Initial follow-up indicated potential for formal presentation to the Advisory Committee in March, but that has been delayed. The legislature would not see this funding as a cost to the program and could provide a “win-win” situation with a reduction of the premium tax and more money for the Center.

6. Dr. Moser noted we have received State funding for this year, however, there has been a 5.2% reduction across the board and a 20% cut in funding for the Center overall. Administration was initially proposed for a 78% cut in funding. The Public Health Director allocated funds on the basis of number of students in each program, which significantly cut funding for the Center and the Industrial Hygiene program. Unfortunately, as a result of the budget cuts, it was necessary to terminate IH administrative assistant, Judy Arrington. Dr. Moser will be meeting with the department to discuss how we can prevent budget cuts and resolve funding issues in the future.
7. Occupational Health Nursing activities have had superb support from OHNs in the area, especially from Ms. Kirkpatrick, Ms Diana Hasselfeld, and Ms. LaDonne Loveday. They have presented to the students in academic courses, lunch hour sessions, and have facilitated field trips. On 10 April, Brad Husberg from the NIOSH Alaska Study Center presented at a noon-hour session.
8. Dr. Paul Richards, a pioneer in Industrial Medicine in the Salt Lake Valley, donated \$90,000 thirty years ago to support industrial medicine training at the University. Unfortunately, the money was spent in other areas and the only residual was a small plaque in the Department. There was a

meeting and luncheon on the 28th of March for the Paul Richards Foundation members in order for the University to make amends. Members were not aware of, but impressed by the Center and the scope of its activities. We hope that there will be potential for follow-on gifts.

9. Dr. Moser has submitted three Bioterrorism proposals recently: The Association of Teachers of Preventive Medicine/CDC, The Association of Occupational and Environmental Clinics and the Utah Department of Health. In addition, Drs. Lillquist and Stephenson are working on a proposal to research the dispersion of gas and fluid flow in urban areas which would be particularly useful for bioterrorism preparedness.
10. Charles D. Brokopp, Dr. P.H., Director of the Division of Epidemiology and Laboratory Services for the State Department of Health, has consented to join the RMCOEH Advisory Committee. He regretted that he was unable to make this meeting due to prior a commitment.
11. RMCOEH will not be leaving this building after all. We were told a few months ago we would be moving to another location but those plans have now been cancelled. Dr. Moser thanks those who wrote letters to University administration in support of us staying in this building.
12. Dr. Moser and his wife Lois are providing endowed scholarships through the University with the first award in 2003. He noted that they will gladly take contributors.
13. In recognition of the contributions given to the Center by the Advisory Committee, Dr. Moser would like to give each member a gift certificate to the restaurant of their choice. Don Marano thanked the Center for the gift.
14. Dr. Hegmann expressed concern over the increasing shortage of Occupational Medicine applicants. He suggested one reason for the shortage may be due to an economic downturn and that people are not returning back to school. Another reason may be the supply/demand changes in health care. Nationally we need to do better marketing of OM opportunities. One problem noted is that insurance for occupational medicine physicians is sometimes not covered. People will not want to get in the field if insurance does not cover medical costs. This problem needs to be dealt with on a national level with new studies and some strategic planning. Dr. Moser noted that Drs. Hegmann and Holmes have worked hard to increase the visibility of the OM program.

Dr. Lillquist noted that historically speaking, Industrial Hygiene has not had a problem with recruiting students, but it is something they have had to start doing. He wants to develop a selection/ screening process. The internet is the best tool to find applicants. The plan is to focus on Utah schools first, then go regionally. They need to target students early when they are juniors and seniors in college - before they have determined a career plan.

15. The RMCOEH hopes to become a more stable and visible force in the community by keeping people working more safely and productively on the job. Dr. Moser noted we have provided support to over 270 industries in Utah. We are helping companies be more profitable. Dr. Nielson emphasized we need to increase our visibility and exposure to the business community: "Workers health and safety is an investment that saves the company money." In return, we need support from the business community and legislature. Mr. Lloyd suggested that we need to be more

proactive in making contacts in the labor field. Commissioner Ellertson would be a good source to go to for help. He serves on some legislative committees that have influence and power in labor funding issues. It was suggested that RMCOEH consider having a representative serve on a health and safety committee.

16. After the break, Mr. Marano suggested the program directors discuss with the committee the critiques given from the last site visit.

Occupational Medicine: Dr. Hegmann said they were again critiqued for the lack of Grand Rounds in the residency program. He indicated that with such a small program, a Ground Round is difficult to do - but they are working on a plan. Site visitors also mentioned the need to define what residents are doing for research projects. Dr. Hegmann suggests the residents should have an opportunity to present their research at the end of the year.

Another concern was the need for revisions in the toxicology course. Dr. Lillquist will change the course syllabus and will also change the course title to read "Inhalation Toxicology" which will better reflect what is already in the content. Dr. Hegmann expressed a need for adequate time to do research. He is presently seeking extramural funding.

Industrial Hygiene: Dr. Lillquist said areas of concern in the program include placing greater emphasis on serving minority populations, beginning with the recruitment of minority students. This year the IH program has its first female African/American student in the history of RMCOEH. Dr. Lillquist noted they will try to recruit students in historically Black colleges or "minority institutions" and will also try to target Hispanics and Native Americans in Utah. He emphasized, however, that the IH program requires undergraduate degrees that are highly scientific. They have to target very select individuals who will qualify.

The critique states we should require fewer core classes and provide more electives to the students. We hope to develop additional courses including Spanish instruction. Another critique was MSPH student internships should require more hours of service than the required 100 hours. We are also looking into providing more evening or weekend MPH/MSPH classes for continuing education students and working professionals. IH had the greatest reduction of score (103 pts) from the previous site visit.

Continuing Education: Ms. Crandall noted the first concern is the minority needs of CE. It is hard to find people to teach that speak Spanish and have an OEHS background. Mr. Parenti emphasized that service industries need safety training. It was noted, however, that NIOSH wants money spent on professionals - not workers. Mr. Lloyd suggested having a conference for employers of Hispanics. Dr. Nielsen noted CE could probably satisfy NIOSH concerns of teaching OEHS risks to Hispanic workers by teaching their supervisors. Ms. Crandall noted her needs assessment survey shows a great need to teach Spanish to employers of Hispanic workers.

CE needs to do more in offering Occupational Medicine and Occupational Health Nursing courses, and the program is presently developing a plan to better serve that need. They are currently talking to Intermountain Health Care. CE also hopes to tie into associations such as the Utah Medical Association. Ms. Morris suggested they do as Washington has done by having a co-

talking to Intermountain Health Care. CE also hopes to tie into associations such as the Utah Medical Association. Ms. Morris suggested they do as Washington has done by having a co-sponsor in another State. She noted Washington currently co-sponsors with Idaho and has some good contacts.

Ergonomics and Safety: Dr. Blosswick reports that NIOSH still believes the program is overly dependent on him. There is concern with Dr. Seseck's status as a non-tenure track faculty member although they view it as a "should and not a must". There are minor course issues that need to be addressed, but overall Dr. Blosswick felt it was a fair review.

Administration:

Dr. Moser noted the site visitors were pleased with the efforts put into documenting the Center's planning process. They still have concerns with the loss of the OHN program, which was discontinued after a history of funding problems and difficulty finding and keeping a director. The report also mentioned a need in offering degree and non-degree training certificates in the core disciplines. Even though we have made good progress, the reviewers note there is still room for further improvements in research. Also, we could improve in developing methods in evaluating the effectiveness of the programs and the Center as a whole.

17. Mr. Marano thanked the committee for their time and contributions to the meeting. The next meeting was planned for October 18, 2002 .
18. The meeting was adjourned at 4:30 pm.

(Note: The Meeting has been rescheduled for Friday, October 25, 2002 at 12:00 pm.)

Appendix ADM-2
Rocky Mountain Center for Occupational and Environmental Health

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Articles, Books, and Book Chapters

(Student Authors Underlined)

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Appendix ADM-3

Partial Listing of Utah Companies Supported by RMCOEH – 2000-2002

A Plus Benefits	Bard Access Systems
A1 Restoration	Barrick Gold Corporation
Abbott Critical Care Systems	BD Medical Systems
Abstract Masonry Restoration	Bear Creek Country Kitchens
Abtech	Bear River Health
AC&S	Bear River Mutual Insurance
Advanced Restoration	Becton Dickinson
AL Restoration	Beehive Clothing Mills
Alcoa	Behavioral health Strategies
ALI	Beneco
All American Environmental	Bingham Environmental
All Weather Waterproofing	Bonneville Artemia Intl.
Allen Memorial Hospital	Bourns Sensors
ATK	Box Elder School District
Allied Security at 3COM	Brigham City Columbia Hospital
AMCOR-Masonry Products	Brigham Young University
AMEC Earth & Environmental	Browning
American Asbestos Abatement	Brush Wellman
American Express	Bud Bailey Construction
American Red Cross	Built-Rite Systems
Amoco	Bureau of Land Management
ANA Development	Bureau of Reclamation
Applied Geo Science	Bush & Gudgell
Applied Geotechnical Engineering	Cache County Schools
Argonaut Insurance Company	Cache Valley Electric
ARUP Laboratories	Cambo Construction
ASARCO	Canyon Fuel Skyline Mine
ASC	Capitol Roofing Service
Ash Grove Cement Co.	Carbon School District
Ashland Environmental	Cargill Salt
Assist Inc.	Central Utah Public Health Dept.
Associated Insulation	Central Utah Water Conservancy
Associates Capital Bank	Central Valley Water Reclamation
At Work Health	Ceramatec
AT&T	Cerro Wire & Cable
ATC Associates	Charrter Oak Environmental Services
Atlas Steel Inc.	Cherry Tree Family Practice
Atwood Mobile Products	Chung & Associates
Autoliv	Cigna Healthcare of Utah
Bacou USA	Circle 4 Farms
Ballard Medical	Cirrus Ecological Solutions
Ballard Spahr, Andrews & Ingers	City of Orem

City of St. George	Class 1 Disaster Recovery
Clarks Quality Roofing	Clearfield city Corporation
CAN Insurance	Dixon Information
Color Country Community Housing	DMBA Workers compensation
Columbia Homecare Equipment	Duchesne County School District
Columbia Ogden Regional medical Center	Dugway Health Clinic
Comfort Systems Intermountain	Dugway Proving Grounds
Commercial Floor	Dupont Holographic
Community Development Corporation	Dyce Chemical
Comp Employee Solutions	Dyno Nobel Americas
Compeq	E A Miller
Computer Sciences Corporation	Eagle Environmental
Concentra	Earth Touch
Connelly & Company	Earth's Pharmacy
Convergys Corporation	Easton Technical Products
Conwest Inc.	EG&G
Cordant Technologies	EHS – University of Utah
Corvel	El;lsworth-Peck Construction
Cottonwood Realty	Emassist
Cunningham Lindsey	Emery county School District
Custom Construction	Employer Solutions Group
CW Mining	Energy West Mining Co.
CWD Environmental Consultants	Ensign Bickford Company
D&G Consulting	Envirocare of Utah
Dana Corporation	Environmental Abatement
DAT Inc	Environmental health Services
Davis County Health Dept.	Environmental Industrial Services
Davis County School District	ERM Rocky Mountain
Davis Hospital	ESIS Risk Management Services
DAW Technologies	ET Technologies
Deer Valley Resort	Evergreen Management Group
Defense Logistics Agency	FAA
Delta Airlines	Layton City Corporation
Delta Environmental Consultants	Fairchild Semiconductor
Department of Environmental Quality	Farmers Insurance
Deseret Chemical Depot	Farmland Foods
Deseret Generator	Felix Therapy Associates
Deseret Laboratories	First American Title Company
Deseret Mutual Benefit Administration	First Security Bank of Utah
Detroit Diesel	Flying J
DHS-OHR	Fort Douglas Army Reserve
Distribution Services Division	Franklin Covey
Dixie College	Freeport Center Associates
	Fresh Air EnvironmentalFrito Lay

Future Industries Corporation
 Garco Builders
 Gardiner Builders
 Gary Blosch
 Geneva Steel
 Geomet Technologies
 Gerber construction
 Griffin-Albers
 GLS Construction Services
 Goer Manufacturing
 Golden Stone Construction
 Golden Years Consultants
 Grainger Industrial Supply
 Granger Hunter Improvement District
 Granite Environmental
 Granite School District
 Great Western Chemical
 Griffith Micro Science
 Growthland/SL County Landfill
 GSL Electric
 Gunn Construction
 Hadeley Brothers Painting
 Hill AFB
 Hallock & Hallock
 Harbertson Construction
 Harding Lawson Associates
 Harmony
 Harris & Hart
 HB Zachary
 HCI/Brenntag
 Health & Safety Services
 Health & Wellness Clinic
 Health & Wellness Services
 Healthworks Occupational
 Healthsouth
 Healthworks
 Helper Medical Clinic
 Herm Hughes & Sons
 Hexcel Corporation
 Holnam
 Honeywell
 Housing Authority of Salt Lake County
 Hub Testing Laboratories
 Huish Detergents
 Construction
 Gateway
 Eeneral Electric
 GSA
 ICM Equipment
 Icon Health & Fitness
 ICW Group
 Ideal home & Development
 IHC
 IHI Environmental
 Industrial Audiology consultants
 Industrial Hygiene Associates
 Industrial Scientific Corporation
 Ingenix
 Integrated Technical Services
 Intermountain Allergy Clinic
 Intermountain Environmental
 Intermountain Power Service
 Intermountain Spine Institute
 International Uranium
 Interstate Brands Corporation
 Interstate Rock Products
 Interwest Mining company
 Iomega
 IPSC
 Iron county School district
 ISB Resources
 Jacobsen Construction
 JBR Environmental
 JKL Asbestos
 Job Corporation
 Johnson Matthey
 Jordan Consulting
 Jordan School District
 Jordan Valley Water conservation
 District
 Judge Memorial Catholic High School
 Kaysville City
 Keith Barton Construction
 Kennecott
 Kimberly-Clark
 Kirk Associates
 Kleinfelder
 KLR Construction

L&N Uniform Supply
 L-3 Communications
 L.W. Miller Transportation
 La Porte Construction
 La-Z Boy Utah
 Lafollette & Associates
 LDS Motion Picture
 LDS Print Center
 Lehigh Safety Shoe Company
 Liberty Mutual
 Lifecare
 Lifetime Products
 Lighting Maintenance & Service
 Little America
 Litton Guidance & Control
 Local Union Asbestos 69
 Lockheed Martin
 Logan City
 Logan Regional Hospital
 LWP Claims Administrators
 MACTEC-ERS
 Magcorp
 Mark Steel Corporation
 Marketfare Foods
 Martelly & Associates
 McFarland Excavating
 McKay-Dee Hospital
 Medifit
 Mellor Engineering
 Mervyn's
 Michael Leavitt & Company Home
 Inspection
 Micron Technology
 Millard county School District
 Millennium Science & Engineering
 Mining Remedial Recovery
 Moog Aircraft
 Moore BCS
 Moroni Feed Company
 Morton International
 Motion Research Association
 Mountain America Credit Union
 Mountainland Rehabilitation
 Mountain West Hearing Center
 Landmark construction
 Larson Davis
 Larwest Engineering & Survey
 Layton Construction
 LDS Church
 LDS Hospital
 Mountainview Medical Management
 MSF
 Murray city Corporation
 National Assessment Corporation
 National Park Services
 Nebo School District
 Neighborhood Housing Services
 Nelco contractors
 Nephi Rubber
 Nestle Frozen Foods
 Nielsen Benefits Group
 NJRA Architects, Inc.
 Novell
 Nowcap
 Nowcare
 Nucor Steel
 Nuskin
 Nutraceutical Corporation
 O'Sullivan Industries
 Oakland Construction
 OC Tanner
 Ogden City School District
 OEA Inc.
 Ogden City Corporation
 Ogden City School District
 Ogden Regional Business Industrial
 Center
 Onsite Environmental Staffing
 Origin Pain & Spine Center
 OSH Salt Lake Technical Center
 Pacificorp
 Pappas Brick & Stone
 Park City Mountain Resort
 Parker Hannifin
 Parsons Behle & Latimer
 Parsons engineering Science
 Pay America
 Pentacore Resources

Pepperidge Farm
 Peppermill
 Performance Technologies
 Petersen, Inc.
 Philip Services
 Phillips Petroleum
 Phipps Construction
 Phoenix Broadband Corporation
 PSI
 PSOMAS
 Purolator Products
 Quest
 Questar
 R&R Environmental
 R&R Roofing
 R&O Construction
 Radon Reduction of Utah
 Randal M. Dixon construction
 Raytheon Service Copany
 Real Estate Institute of Utah
 Realty Check Inspections
 Redi Insulation
 Regence Blue Cross Blue Shield
 Reis Environmental
 Reliance Industries
 Reston-Bains
 Rhodes Bank-N-Serv
 Richard Manufacturing Company
 Richard, Brandt, Miller, nelson
 Ritucci & Associates
 Rocky Mountain Asbestos Abatement
 Rocmont
 Roos, Inc.
 Rowland Consulting
 Rowland-Hall St. marks School
 Royal Insurance
 RST & Associates
 So. Ogden Center for Family Medicine
 South Salt Lake Code Enforcement
 Salt Lake community College
 Safety Management Services
 SAIC
 Salt Lake Circuits
 Salt Lake City airport Authority
 Pinnacle Risk management
 Praxair
 Precision Technology Inc.
 Presto Products
 Primary Children's medical Center
 Professional Staff Management
 Provo City
 Provo School District
 Salt Lake City Corporation
 Salt Lake City Engineering
 Salt Lake City International Airport
 Salt Lake City School District
 Salt Lake City-County Health Dept.
 Salt Lake Community Action Pro
 Salt Lake County
 Salt Lake County Housing Authority
 Salt Lake Industrial Clinic
 Salt Lake Orthopedics
 Salt Lake Regional Medical Services
 Salt Lake Valley health Department
 San Juan School District
 Sandy City
 Savage Glass Company
 School and Institution Trust Lands
 Admin.
 Schreiber Foods, Inc.
 Secor International
 Sellers Group
 Sevier School District
 Shape Rite
 Shelly Hansen & Associates
 Salt Lake County Sewerage
 Improvement District
 Salt Lake Housing & Neighborhood
 Development
 Smith Megadiamond
 Smurfit-Stone Container
 SOS Staffing Services
 South Ogden enter for Family Medicine
 South State Insulation
 South Summit School District
 South West Development Center
 Southeastern Utah District Health Dept.
 Southern Utah University

Southwest Utah Health Dept.
 Southwest Utah Public Health
 Specialized Surgery Associates
 Staker Paving
 State of Utah School & Institutional
 Trust
 State of Utah – Risk Management
 Stein Ericksen Lodge
 Sterling Boiler & Mechanical
 Summit County Public Health
 Tesoro Petrol
 Thatcher
 The Layton Companies
 Thermal West Industrial
 Thermotux Inc.
 Tintic School District
 Tintic Utah Metals LCC
 Tooele Army Depot
 Tooele County Health Department
 Tooele county School District
 TOSH W.C.
 Travelers Aid society
 Tremco Inc.
 Tricounty Health Department
 Trinity Industries
 TRW
 Turner & Company
 U of Radiological Health
 U.S. Healthworks
 UDOH
 UDOT
 Uintah Basin Assoc of Gov.
 Uintah School District
 Ultradent Products
 Union Pointe
 United States Air Force
 University of Utah Computer Science
 University of Utah Electrical
 Engineering
 US Air Force
 US Army
 US Army Health Clinic
 US Forest Services
 USF&G Insurance
 Sunshine Terrace Foundation
 Superior Environmental
 SWC Consultants
 Swift Painting
 Sysco Intermountain Food
 Taylor Made enterprises
 Taylorsville-Bennion Improvement
 District
 TC Advertising
 Terracon, Inc.
 Utah State University
 Utah County Medical Association
 Utah Division of Solid & Hazardous
 Waste
 Utah Federal Safety & Health Council
 UTA
 Utah Air National Guard
 Utah Correctional Industries
 Utah County Health Department
 Utah Disaster Kleenup
 Utah Industrial Depot
 Utah Local Government Trust
 Utah OSHA
 Utah Safety Council
 Utah School Boards Insurance
 Utah State Dept. of Administrative
 Services
 Utah Tile & Roofing
 Utah Valley Regional Medical Center
 Utah alley State College
 Utah Wind Power Campaign
 Utility Trainer
 UVEX Safety
 V-J Environmental
 VA Medical Center
 Valley Paint Manufacturing
 Valley View Medical Center
 VAM Wolves
 Varian Associates
 Verio Web Hosting
 Versar, Inc.
 Wasatch Academy
 Wasatch County School District
 Wasatch Crest

Wasatch Energy Systems
Wasatch Environmental
Washington county School District
Watson Labs
Workers compensation Fund of Utah
Weather Shield Manufacturing
Weber Basin Job Corps
Weber County School District
Weber State University
Weber-Morgan Health Department
Wecco
Weidner & Associates
Westland Ford
Weyerhauser
Wheeler Machinery
Williams Field Services
Williams Gas
Wiltec Research Company
WIRC/American Authority
Work Care
WRs Infrastructure

Weir Specialty Pumps
Welfare Safety Services
Wells Construction
West Pro
West Valley City Housing
Westech Engineering
Western Coating
Western Distribution Associates
Western Pipe Fabrication
Western Precision
Western Rock Products
Western Truck
WWW Clyde & Company
Xpedx
Young Electric Sign
Zenith Insurance
Zions Securities Corporation

Appendix ADM-4

ROCKY MOUNTAIN CENTER FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH

CURRENT COLLABORATION PARTNERS (Partial Listing)

State

Utah Department of Health	Industrial Health Incorporated
Utah Department of Environmental Quality	AHEC
Utah AFL/CIO	Alliant-Tech Systems
Utah Labor Commission	Becton-Dickinson
Utah Safety Council	Brigham Young University
Utah Governors Council on Physical Fitness	Weber State University
Workers Compensation Fund of Utah	Utah State University
Utah Poison Control Center	Salt Lake Community College
Local Chapters:	Utah Self Insurance Association
American Industrial Hygiene Association	Utah Safety Council
Utah Association of Occupational Health Nurses	Utah Conference on Safety and Industrial
Hygiene	Olympic Organizing Committee
American Society of Safety Engineers	
Academy of Hazardous Materials Managers	
IHMM (Hazardous Materials Managers)	

National and Regional:

Rocky Mountain Academy of Occupational and Environmental Medicine (CO)
Colorado State University (TPG and High Plains Intermountain Center for Agriculture Health and Safety)
Montana Tech University (TPG)
Montana State University
St. Mary's Hospital Occupational Medicine Department (Grand Junction, CO)
U.S. National Park Service–Western Region
U.S. Environmental Protection Agency and Agency for Toxic Substances and Disease Registry (Alberton, MT project)
University of New Mexico
Idaho Governor's Conference on Safety and Health
AIHA–Teton Section
Federal OSHA Health Response Team
Salt Lake Technical Center, Federal OSHA
Federal OSHA Health Response Team
Association of Occupational and Environmental Health Clinics
United Auto Workers/Ford Motor Company
UAW-Ford National Committee of Health and Safety
Joint Council on Health, Safety, and Environmental Education of Professionals
National Safety Center–Institute for Safety Through Design
U.S. Department of Energy
 Los Alamos National Laboratory
 Idaho National Engineering Laboratory
 Lovelace Respiration Research Institute

INDUSTRIAL HYGIENE PROGRAM

ABSTRACT and OVERVIEW

Graduate level trained industrial hygienists are essential members in team-based occupational health and safety programs and continue to be in significant demand. The University of Utah's Industrial Hygiene (IH) program was established in 1978 as part of the original Education and Research Center (ERC) grant of the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH). The IH program has been continuously supported by NIOSH funding since. The vision statement of the IH program is: "To be the Nation's best graduate level industrial hygiene training program."

Thirty-two students were enrolled during the grant period. Graduates of the Master's program are well prepared to meet current and projected challenges in occupational health and safety. The quality of the training program is nationally recognized. Graduates are very successful in obtaining responsible positions within the region and the nation (>97% placement rate), have proven to be competent practitioners, and consistently contribute to the development of the profession.

The Academic curriculum is designed to offer the best master's level IH preparation available. It comprises didactic, field, and research experiences. Course work is designed to meet ABET-RAC accreditation requirements, including significant theory, laboratory, and field experience. Research has been re-emphasized and faculty and student research projects routinely address National Occupational Research Agenda (NORA) priority areas. The program is regularly critiqued by students and graduates, Center Advisory Committee members, other University of Utah faculty, and national leaders in IH.

The day to day operation of the IH program is accomplished by three full-time faculty members. Complementary full time faculty are in safety and ergonomics (2), occupational/environmental medicine (3), and numerous epidemiologists, biostatisticians, injury control specialists, environmental health experts, and other public health faculty. In addition to full-time faculty employed by the university, numerous clinical faculty from various government, industry, and academic organizations, support the program and supplement the knowledge base.

SIGNIFICANT FINDINGS

The following is a summary of progress in accomplishing the overall goals for the Industrial Hygiene program for the 2000 - 2003 grant period.

Goal 1 : To maintain and improve the quality of the Rocky Mountain Center's IH didactic education.

Results: Accomplished. The IH program has embraced a continuous quality improvement philosophy. The program regularly seeks and acts on input and recommendations from current students, graduates, Center Advisory Committee members, other University of Utah faculty, and national leaders in IH. Identification of redundancies and deficiencies is on-going and findings are addressed to ensure the Program's currency and relevance. The IH program went through a significant restructuring immediately prior to 2000, including significant faculty changes and the University's conversion from quarters to semesters. These activities required a comprehensive evaluation of courses, course content, and course materials. New faculty brought different knowledge bases and interests which have been integrated into the program. The IH faculty have assumed course director responsibility for a public health core course - Environmental Health Problems - and have been able to integrate basic occupational health aspects. Appendix IH-1 provides a listing of faculty and Appendix IH-2 lists enrolled students.

Goal 2: To improve research quality and research production.

Results: Accomplished. A renewed emphasis on research was initiated with two new IH faculty. More formalized efforts, via research seminars, have been developed to increase the research success of IH students. Pilot Project Research Training (PPRT) grants have provided expanded research training opportunities for IH junior faculty and students. These efforts, as well as active support of the Center's Research Plan, have resulted in an increased number of grant submission, funded research projects, technical presentations, and publications. Most of the IH research projects and publications involve students.

Goal 3: To maintain the faculty's level of regional and national service responsibilities and increase student opportunities.

Results: Accomplished. The IH program funds student membership in the AIHA-UT section, using non-NIOSH funds. The program continues to be involved in numerous continuing education, outreach and service activities, as detailed in the following section.

Goal 4. To expand interdisciplinary and collaborative efforts between IH and the allied health, safety, and environmental professions and organizations.

Results: Accomplished. As a result of losing the Occupational Health Nursing program, a new and formalized effort was initiated by the core components of the Rocky Mountain Center to improve interdisciplinary opportunities. More classroom and seminar discussion on the interdisciplinary team approach has been developed. Further, the majority of research programs and contracts include collaborative investigators and participants outside the IH Program.

BODY OF REPORT WITH CONCLUSIONS

Goal 1: To maintain and improve the quality of the Rocky Mountain Center's IH didactic education.

Objective 1.a.: Maintain RAC-ABET accreditation and become more involved in the accreditation process.

Results: Accomplished. The IH Program has ABET-RAC accreditation through 2004. Drs. Lillquist and Stephenson are members of the American Industrial Hygiene Association's Academic Special Interest Group where significant discussion and recommendations for ABET criteria occur. Dr. Stephenson has completed training as an ABET-RAC site visitor and is waiting scheduling to participate in a site-visit.

Objective 1.b.: Accomplish on-going critiquing and improvement of the academic and continuing education courses IH students attend.

Results: Accomplished. The IH program went through a significant restructuring immediately prior to 2000, including significant faculty changes and the University's conversion from quarters to semesters. These activities required a comprehensive evaluation of courses, course content, and course materials. The effort resulted in a strategically designed course of study with appropriate overlap and integration of curriculum. The program regularly seeks and acts on input and recommendations from current students, graduates, Center Advisory Committee members, other University of Utah faculty, and national leaders in IH. Identification of redundancies and deficiencies is on-going and are addressed ensuring the Program's currency and relevance.

Continuing education, including asbestos, lead, HAZWOPER certifications is continually stressed. All CE courses are available to students at no charge. The CE program administers its own course evaluation, course development, and course improvement program.

Objective 1.c.: Further increase the caliber of applicants to the IH program through quality outreach and recruiting efforts.

Results: Partially Accomplished. The IH Program has had three very good recruiting years, both in quantity and quality of applicants. The entering class of 2001 included six out-of-state students, including four military officers. However, a recruitment program involving standing dates for visits to targeted undergraduate programs has only been partially successful. Fourteen students graduated during the Spring 2000 - Spring 2002 period.

Objective 1.d.: Continue to improve equipment and instrumentation, including computer resources.

Results: Accomplished. A computer replacement program is in place, replacing one new computer annually. The program has three faculty and two student computers, thereby having a five-year obsolescence cycle. The University of Utah's library system has maintained its holding of occupational health and safety journals, including electronic subscriptions. Mr. DeRosso has developed a five-year IH equipment purchasing plan. The plan is based on existing equipment, future needs, and a prioritization list. The laboratory equipment budget is now approximately \$1500/year, not including equipment from research grants and contracts.

Objective 1.e.: Maintain a strong AIHA-Student section.

Results: Partially Accomplished. The Public Health Program has recently initiated a Student Section. IH students are very involved in this opportunity for professional development. IH students are very involved in numerous extra-curricular activities. (See also objective 3.b.)

Objective 1.f.: Increase the alumni contribution to the IH program support fund.

Results: Accomplished. Alumni contributions are now solicited annually, and contributions are strengthening the support fund.

Goal 2: To improve research quality and research production.

Objective 2.a.: Develop a research strategy that capitalizes on the strengths of a multi-disciplinary faculty.

Results: Accomplished. Research was emphasized in the hiring of new faculty. Drs. Lillquist, Stephenson, and Mr. DeRosso have been successful at obtaining funding for numerous research grants, significantly increasing the total number and dollar support. RMCOEH faculty developed a Center Research Plan that delineated focus areas, emphasizing NORA priorities, sources of funding, timelines for submissions, and opportunities for collaboration.

Objective 2.b.: Produce three IH extramural research grant proposals per year.

Results: Accomplished. IH faculty submitted nineteen research proposals during the two year grant period.

Objective 2.c.: To have two of the three extramural grant proposals reflect multi disciplinary collaboration.

Results: Accomplished. The majority of grants include collaboration with faculty including: safety and ergonomics, public health, occupational medicine, engineering, pharmacology and toxicology, and family medicine.

Objective 2.d.: To improve research mentoring and the development of junior faculty and graduate student's research skills through research seminars and research projects.

Results: Accomplished. The research seminar has been very successful in better preparing students for their research. The teaching load has been more evenly distributed across the three full-time faculty positions, which allows additional time for junior faculty to develop their research skills. All faculty attend workshops and seminars on grants writing. The Pilot Project Research Training program has supported three research projects by junior faculty.

Objective 2.e.: To support two student research projects per year under research grants.

Results: Partially Accomplished. IH students are always involved in IH faculty research projects. Most students are supported under the NIOSH training grant and not on the research grant.

Objective 2.f.: To create a student operations and research manual.

Results: Accomplished. The manual is in its second year of use. It is updated annually at the start of each academic year and provided to students then. It also is posted on the Center's website. It provides information on typical study plans, research opportunities, funding sources, and other pertinent information.

Objective 2.g.: Have at least 66 percent of student research projects submitted to a peer-reviewed journal.

Results: Partially accomplished. Approximately 14 (45%) of students have submitted papers, with five published to date. Nine students have presented at national meetings.

Objective 2.h.: Submit a minimum of two manuscripts for publication in a peer-reviewed journal per year per full-time doctoral faculty member.

Results: Accomplished. Faculty have published eight journal articles, three book chapters and one book.

Goal 3: To maintain the faculty's level of regional and national service responsibilities and increase student opportunities.

Objective 3.a.: To have Dr. Stephenson and Mr. DeRosso join one additional national professional committee.

Results: Partially accomplished. Dr. Stephenson has joined the AIHA-Academic Special Interest Group and attends the AIHA - International Committee meetings. Mr. DeRosso has focused on developing state and regional committee activities.

Objective 3.b.: To increase student participation in local and national professional organizations and conferences.

Results: Accomplished. The IH program pays for student membership to the AIHA-UT Section (using non-NIOSH funds). Attendance at the quarterly meetings is strongly encouraged. Travel and per diem will be paid for any student who has had a paper accepted for presentation at a professional meeting. Student attendance at the Joint Utah Conference on Occupational Safety and Health and the National AIHAC&E is very high.

Objective 3.c.: Continue to present the highest quality, timely and informative CE courses in IH.

Results: Accomplished. Continued strategic planning is on-going with the Center's CE program. Contract courses and shorter (seminar format) courses are being discussed for the future. Recently, both an environmental mold course (risk assessment and remediation) and an exposure assessment course was developed and conducted. Twenty-five CE courses with an IH focus were presented during this grant period (including courses presented two or more times per year).

Goal 4: To expand interdisciplinary and collaborative efforts between IH and the allied health, safety, and environmental professions and organizations.

Objective 4.a.: Increase partnerships with regional universities, state and federal governments, and private organizations.

Results: Accomplished. Research partnerships have been entered into with representative organizations from those listed above. Examples include Montana Tech University, Colorado State University, Utah Department of Environmental Quality, Utah Department of Health, Utah Environmental Health Association, Federal and Utah OSHA, EPA, Idaho National Environmental and Engineering Laboratory, and Los Alamos.

Objective 4.b.: Continue the program's strong interdisciplinary emphasis.

Results: Accomplished. The IH program reflects the Center's on-going and strong emphasis on interdisciplinary interaction. Many opportunities exist for IH students to work with E&S and OM faculty and students. OHN principles and practice presentations have been formally integrated into the program to assure exposure to the profession. Informal opportunities are also numerous through research, seminar and social functions.

CONCLUSION:

Fourteen students graduated during the grant time period. There have been significant, positive, changes to the IH Program. Courses continue to be developed and improved. Hands-on and professional experience is emphasized. Research efforts are reflected in IH faculty authoring eight journal articles, three book chapters, and one book. Nine students have presented at professional meetings and 5 students have co-authored papers. An increased emphasis in research activities has changed the complexion of the program. Through the changes, and because of them, the program succeeded in accomplishing or partially accomplishing all identified goals and objectives. The result continues to be that students receive excellent preparation for the professional practice of industrial hygiene in the multi-disciplinary and academically rigorous setting afforded by an Education and Research Center.

INDUSTRIAL HYGIENE
APPENDICES

Appendix IH-1 Faculty

INDUSTRIAL HYGIENE FACULTY AND RESPECTIVE RESPONSIBILITIES/STRENGTHS*		
NAME	ACADEMIC RESPONSIBILITIES	Estimated % Effort*
FULL-TIME INDUSTRIAL HYGIENE FACULTY		
Frank DeRosso, MSPH, CIH	Instructor; Primary responsibility for academic courses <i>Advanced IH</i> and <i>Advanced Hazardous Substances</i> ; Course director and major contributor to many CE courses. Student advisor; student research committees	100
Dean R. Lillquist, PhD, MSPH, CIH	Program Director; Primary academic course responsibility for <i>Industrial Toxicology, Ventilation, and research seminar</i> ; Course director and major contributor to many CE courses. Student advisor; student research committees	100
Dale J. Stephenson, PhD, CIH	Assistant Professor; primary academic course responsibility for <i>Occupational Safety & Health</i> , and <i>Noise and other Physical Agents</i> ; Course director and major contributor to many CE courses. Student advisor; student research committees	100
PART-TIME CLINICAL FACULTY WITH SPECIFIC COURSE RESPONSIBILITY		
James Nelson, PhD	Clinical Associate Professor; primary responsibility for industrial hygiene chemistry aspect of <i>Advanced IH</i> ; student research committees; student preceptors; lectures in CE.	12
SUPPORTING FULL-TIME UNIVERSITY FACULTY		
Steve Alder, PhD	Instructor, Family and Preventive Medicine. FPMD6100 - Intro Biostats. Student advisor; student research committees	8
Don Blosswick, PhD, PE, CPE	Associate Professor, Mechanical Engineering. Primary academic course responsibility: ME6100-Ergonomics; ME6110-Intro to Industrial Safety, ME7100-Advanced Ergonomics, ME7110- System Safety. Course director and major contributor to CE courses. Student advisor; student research committees	15
Marlene Eggar, PhD	Professor, Family and Preventive Medicine. FPMD6960 - Public Health Practicum	8
Kurt Hegmann, MD, MPH	Associate Professor, Family and Preventive Medicine. FPMD: 6703 - Occupational and Env Diseases; 6701 - Adv Environ Phys. Student advisor; student research committees	15

Lynn Lyon, MD, MPH	Professor, Family and Preventive Medicine. FPMD: 6300 - Intro to Epi; 6501 - PH Seminar. Student advisor; student research committees	10
Royce Moser, MD, MPH	Professor, Family and Preventive Medicine. FPMD: 6400 - Admin Occ & Env Health; 6705 - Env & Occ Medicine; 6706 - Aerospace Medicine Course director and major contributor to many CE courses. Student advisor; student research committees	10
James Reading, PhD	Professor, Family and Preventive Medicine. FPMD6100 - Intro to Biostats. Student advisor; student research committees	8
Richard Sesek, PhD, CSP	Assistant Professor, Mechanical Engineering. Primary academic course responsibility: FPMD6759-OEH&S Field Trips, ME6960 - Human Factors; significant responsibility in ME6100 - Ergonomics, ME6110 - Intro to Industrial Safety; Major contributor to many CE courses. Student advisor; student research committees	10
Tony Suruda, MD, MPH	Student advisor and student research committees	15
Lillian Tom-Orme, PhD	Assistant Professor, Family and Preventive Medicine. FPMD6600 - Social Context	8
George White, PhD, MSPH	Professor, Family and Preventive Medicine. FPMD6500 - Intro to Public Health. Student advisor; student research committees	10
IH VOLUNTEER CLINICAL FACULTY		
Tori Burns, MSPH, CIH Utah Labor Commission, UtOSHA	Clinical Instructor; RMCOEH Advisory Committee, IH hiring sub-committee, Instructor in academic and CE	2
D. Jeff Burton, MS, CIH, CSP, PE President, I'VE, Inc.	Clinical Instructor; RMCOEH Advisory Committee, Instructor in academic and CE	2
Bobby Craft, PhD, CIH, CSP Associate Professor, retired	Clinical Professor	1
Dan Crane, ME USDOL, OSHA	Clinical Instructor, involved in research projects	1
Kevin Cummins, MS, MSPH, CIH USDOL, OSHA	Clinical Instructor; Clinical Instructor; RMCOEH Advisory Committee, IH hiring sub-committee, Instructor in academic and CE	4
Robert Curtis, MS, CIH USDOL, OSHA,	Clinical Instructor; RMCOEH Advisory Committee; class project coordinator, research committees, Internship advisor, Instructor in academic and CE	8

Howard Deer, PhD UT Agriculture Extension Service	Clinical Associate Professor; RMCOEH Advisory Committee, Instructor in academic and CE.	2
Nancy Fox, MSPH Dept. of Public Safety, Weber State Univ.	Clinical Instructor; IH hiring sub-committee, Instructor in academic and CE	4
Lee Hathon, MSPH, PE USDOL, OSHA, Salt Lake Tech Center	Clinical Instructor, Instructor in academic and CE	2
Allan Heins, PhD, CIH, PE USDOL, OSHA, Salt Lake Tech Center	Clinical Instructor; Advisory Committee, Instructor in academic and CE	4
P. David Klanica, MSPH Phillips 66 Petroleum	Clinical Instructor; class project coordinator; on-going preceptor, Instructor in academic and CE	5
Sim Lessley, PhD Analytical Quality Solutions, Inc.	Clinical Instructor, Instructor in academic and CE	2
Don Marano, PE, CIH President, IHI Environmental, Inc.	Clinical Instructor; RMCOEH Advisory Committee (Chair); on-going preceptor, Instructor in academic and CE	5
David Nelson, MS President, Envirosearch, Inc.	Clinical Instructor, Instructor in academic and CE	1
James Nelson, PhD, CIH President, DataChem Laboratories, Inc.	See "Part-time Clinical Faculty"	See above
Mohammad Sondossi, PhD Prof., Microbiology, Weber State Univ.	Clinical Associate Professor, involved in research projects	4
Mike Taylor, MSPH, CIH Health and Environ. Mgr., LDS Church	Clinical Instructor; RMCOEH Advisory Committee; class project coordinator; on-going preceptor, involved in research projects	8
William Wagner, MS, MSPH, CIH, CSP, IHI Environmental Inc., retired		1
Kenneth White, MS, MSPH, CIH Vice President, IHI Environmental	Clinical Instructor; IH hiring sub-committee; on-going preceptor; Instructor in academic and CE	4
Lowell White, PhD, CIH Environ. Health Manager, Geneva Steel	Clinical Instructor	1

*- Estimate of effort is based on a full time effort consideration of 45 weeks per year or 1800 hours per year (a nine month appointment is approximately 1400 hours per year and would reflect more % effort).

Appendix IH-2
Industrial Hygiene Program Students and Graduates
7/1/00 - 6/30/02

Names Omitted due to University Policy - Initials of students used in place of name.	Date Entered Program	Date Program Completed	Degree Awarded	Current Employment Status (Job title/employer)	Current Business Address
J. J.*	9/93	8/00	MPH	Abbott Laboratories	SLC UT 84123
A.M.	9/94	6/01	MPH	Medical Technologist VA Hospital	SLC UT 84148
M. F.	9/96	8/01	MSPH	Baxter	Round Lake IL 60073
M.W.	9/96	8/00	MSPH		
T.H.	9/97			EROM	Colorado Springs, CO
J.C.	9/97	6/01	MSPH	Utah Labor Comm 160 E 300 S 3 rd Fl	SLC UT 84114
J.L.	9/97	6/01	MSPH	Industrial Hygienist Utah OSHA	160 E 300 So 3 rd Fl SLC UT 84114
C.S.	9/97	8/00	MSPH	US Navy	Portsmouth VA 23709
D.G.	8/98	8/00	MSPH	Federal OSHA	Bellevue WA 98004
B.P.	8/98			Autoliv ASP	Ogden UT 84335
T.A.*	8/99	8/01	MPH	BD Medical Systems	9450 S State Sandy, UT 84107
F.C.*	8/99			Autoliv	Ogden, UT 84401
W.C.	8/99			EnviroCare	46 W Broadway SLC UT 84101
S.D.	8/99	5/02	MSPH		

* Please specify by asterisk those program graduates that **have not** received NIOSH financial support.

C.H.*	8/99	8/01	MSPH	Sandia Natl Labs	Albuquerque NM 87185
M.K.*	8/99			Biomangement, Inc	SLC, UT
A.R.	8/99	5/01	MSPH	Safety Office Naval Aviation Depot	Cherry Point NC 28533-0021
S.T.	8/99	5/01	MSPH	Colorado State Univ	PhD Environmental Health
K.G.	8/99				
C.A.	8/00	5/02	MSPH		
R.J.*	8/00			Student	
K.M.	8/00			Student	
J.M.*	8/00			Student	
D.A.*	8/01			Student/US Air Force	Hill Air Force Base
J.B.	8/01			Student	
B.C.*	8/01			Student	
J.I.	8/01			Student	
M.L.*	8/01			Student/NROTC	
C.S.	8/01			Student	
K.S.*	8/01			Student	
K.T.	8/01			Student/OSHA Technical Institute	
D.Y.*	8/01			Student/US Air Force	

*Please specify by asterisk those program graduates that did **not** receive NIOSH financial support.

* Please specify by asterisk those program graduates that **have not** received NIOSH financial support.

OCCUPATIONAL MEDICINE PROGRAM

ABSTRACT and OVERVIEW

The Occupational Medicine (OM) program is an academic and clinical teaching program that has been funded through the University of Utah's Education and Research Center (ERC) since its founding in 1978. The program provides predoctoral training to medical students, graduate training to physicians through the Department of Family and Preventive Medicine's (DFPM) Master of Public Health (MPH) and Master of Science in Public Health (MSPH) programs, and clinical training to residents in occupational medicine, family medicine, and internal medicine. The program has three full-time, two part-time faculty, and three other faculty members who participate regularly in our educational programs. An additional 13 volunteer clinical (adjunct) faculty also provide support to the program. (Please see Table OM-1.) The clinic provides consultation services to the Intermountain West region.

During the 2000-2002 grant period, there were nine OM residents enrolled in the program, and another four residents who accomplished the MPH as part of their US Air Force residency in Aerospace and Occupational Medicine. New preceptorship sites in the private sector were added, and inactive sites were dropped. Occupational medicine faculty received extramural funding in the amount of \$473,000 for three research studies in occupational health. A research paper requirement was instituted for occupational medicine residents at the PGY-3 (practicum) level in 1999. There were 35 publications accepted or submitted during the grant period, and noted in Appendix OM-1.

The program director changed during the grant period. Dr. Hegmann, former deputy director, now directs the program and Dr. Suruda is working part-time. The academic phase continues to undergo gradual changes to improve the curriculum. For example, the Occupational and Environmental Diseases class has a completely revised extensive syllabus. The preceptorship sites are currently undergoing curricular changes to improve these as well.

SIGNIFICANT FINDINGS

Goal 1. The OM Program will continue to provide superior graduate training in occupational and environmental medicine to physicians.

Results: Accomplished. The program remains fully accredited by the Accreditation Council for Graduate Medical Education. Five residents graduated from the program during the grant period, and graduates and current residents continue to rate the program highly.

Goal 2. Respond to the need for residents in other specialties and medical students to develop occupational and environmental medical (OEM) clinical expertise.

Results: Accomplished. Rotations in OEM have been provided to residents in internal medicine and family practice with lengths varying from a few days to 4 weeks. The length of a given rotation is determined by external factors, primarily the residency program director. Medical students also rotate through OEM in their 4th year. Most medical student rotations are 4 weeks in length and provide a good introduction to OEM. Specific composition of a rotation is tailored to the resident's/student's goals and needs.

Goal 3. Provide superior continuing education (CE) offerings in OEM and related topics.

Results: Accomplished. During the current grant period, 21 CE courses with OEM emphasis were provided. (See details in the CE section.) These programs have resulted in several hundred contact hours of education.

Goal 4: Accomplish research that emphasizes NORA priority areas and provides opportunities for research training.

Results: Accomplished. The OM program faculty have continued research in several NORA areas of emphasis and added others. Areas of research activity include: Musculoskeletal (and other) injuries in home healthcare workers, several studies on worker injuries in other groups, continued work on the UAW-Ford project on musculoskeletal diseases, surveillance projects, shoulder girdle fatigue studies, Department of Transportation medical examinations, and disability issues. Additional extramural funding proposals have been submitted.

Goal 5. Maintain and enhance the OM program's interdisciplinary focus in all its activities.

Results: Accomplished. Noon meetings with Industrial Hygiene (IH) and Ergonomics and Safety (E&S) students have been held regularly to expose all disciplines to Occupational Health Nursing (OHN) principles and practice. Several academic courses continue to be cross-disciplinary and require interdisciplinary interactions, including the Public Health Programs' summative "Comprehensive Examination." OM faculty continue to provide the interdisciplinary instruction and conduct interdisciplinary research activities for graduate students, medical students, residents and faculty.

BODY OF REPORT WITH CONCLUSION

As indicated in the Summary of Significant Findings section, five goals were established for the OM program. Specific objectives were established for each goal. The following details the progress in accomplishing these objectives:

Goal 1: The OM program will continue to provide superior graduate training in occupational and environmental medicine (OEM) to physicians.

Objective 1a: Maintain Accreditation Council for Graduate Medical Education (ACGME)-accreditation of the residency.

Results: Accomplished. The program is in a 5-year accreditation cycle at the current time and due for a site visit October 2003. The program continues to make changes to improve the learning experiences even though no deficiencies were noted in the last site visit. Table OM-2 lists current rotation sites for residents.

Objective 1b: Train and graduate a minimum of two OM residents each year who are qualified to sit for the American Board of Preventive Medicine examination.

Results: Accomplished. We have averaged 2-3 graduates per year in 2000-02, and the upward trend continues. Table OM-3 lists residents enrolled during the grant period.

Objective 1c: Provide OM residency training at the PGY-3 level (only) for applicants qualified to enter at that level.

Results: Accomplished. We continue to offer this option and successfully train 1-2 such residents per year.

Objective 1d: Provide superior training in OEM at the MSPH/MPH level to other physicians, IH specialists, E&S, OHN's, and other health professionals.

Results: Accomplished. The OM program continues to actively teach in the Public Health Programs, providing several courses per year as well as lectures for the other programs (e.g., IH, E&S). Although the Center no longer has an OHN program, we continue to train nurses through the curricular and continuing education offerings.

Goal 2: Respond to the need for residents in other specialties and medical students to develop OEM clinical expertise.

Objective 2a. Provide training opportunities to residents in other training programs.

Results: Accomplished. These activities have increased over the past 2 years. There are more residents from other programs taking our curricular offering than previously (e.g., Neurosurgery, Family Practice and Emergency Medicine). We continue to provide residents with clinical OM experiences, with emphasis on teaching primary care residents.

Objective 2b. Provide education in OM and related topics to medical students, to include provision of at least 8 hours in OEM in the medical school curriculum.

Results: Accomplished. This effort is constrained by the administration of the medical school which currently does not provide extensive OEM training of medical students. However, through additional guest lectures and participation in courses (Science of Medicine, Healthcare in the Community, etc.), faculty now have over 8 hours of contact time per year with medical students.

Goal 3: Provide superior continuing education (CE) offerings in OEM and related topics..

Objective 3a: Conduct at least four training programs annually.

Results: Accomplished. OM program faculty continue to conduct CE programs with several hundred contact hours per year. During the grant period, 21 CE courses with OEM emphasis were presented, including courses presented more than once during the two years. (See CE reports for details.)

Goal 4: Accomplish research that emphasizes NORA priority areas and provides opportunities for research training.

Objective 4a. Design and conduct research that focuses on NORA areas of interest.

Results: Accomplished. The OM program's research activities include extramurally funded contract and unfunded projects involving musculoskeletal disorders, populations at risk, exposure assessment methods, and surveillance methods.

For the 2000-2002 grant period, OM program research included:

1. An ATPM-CDC (NIOSH) cooperative agreement, the first of its kind through NIOSH, assessing injury risks in home healthcare workers. Dr. Hegmann is the P.I.
2. Completion of the UAW-Ford project to evaluate ergonomics tools. Dr. Suruda was an investigator on that project.
3. A case-control study of colorectal cancer, evaluating a database of several thousand cases for occupational risks. Dr. Hegmann is leading this effort.
4. Studies of disability in workers compensation. Dr. Holmes performed this first as a resident and subsequently as faculty.
5. A surveillance program for bioterrorism. Dr. Hegmann is P.I.
6. Several studies on occupational injuries. Dr. Suruda is P.I. for these small studies.

Additionally, faculty have submitted research proposals for external funding during 2002 that would involve musculoskeletal disorders in a cohort study and occupational and environmental medicine issues in a public health department. Both proposals are multi-year and the scores indicate they have an excellent chance of being funded..

Objective 4.b. Provide elective research opportunities for OM residents.

Results: Accomplished. Since a research requirement was initiated in 1999, residents have been much more active in research as seen by the residents listed in the publications. (Appendix OM-1). Interestingly most of this research has been accomplished without a specific research rotation through some have used that option to accomplish this goal.

Objective 4.c. Support implementation of the University - approved Ph.D. program.

Results: Not Accomplished. While desired, this remains unfunded. OM faculty continue to work with other Public Health faculty in efforts to obtain funding.

Goal 5. Maintain and enhance the OM program's interdisciplinary focus in all its activities.

Objective 5a. Continue to provide opportunities for IH and E&S students to join OM and OHN students in the OM clinic.

Results: Accomplished. We have provided opportunities for students in all cores to participate in noon conferences for OHN educators and other opportunities in the clinics when patients with appropriate problems are being evaluated, are provided. Students have found this experience most beneficial, and we will continue this activity during the proposed grant period.

Objective 5b: Continue to provide interdisciplinary instruction in the MSPH/MPH program.

Results: Accomplished. OM Academic programs have continued to have an interdisciplinary team instruction approach with instructors from two or more cores teaching the programs. Residents take courses with IH, and E&S students. This interaction will continue in the future.

Objective 5c: Continue interdisciplinary research programs.

Results: Accomplished. OM faculty and students have typically worked with members of other RMCOEH cores in designing, accomplishing, and analyzing research projects. Recent NORA and other RMCOEH proposals have had similar multidisciplinary foci, underscoring the Center's and the OM program's commitment to continuing these approaches. These activities have increased over the past 2 years.

CONCLUSION:

All goals for the 2000-2002 period were accomplished. All specific objectives were accomplished with the exception of the Ph.D. program which remains unfunded due to external factors. We are continuing to work to make that program a reality. There were nine physicians enrolled in the OM residency and another four residents involved in the programs through the US Air Force. These are increased over prior years. Thirty five publications are attributable to this funding period, as is over \$473,000 in extramural research funding.

Table OM-1
FACULTY PROVIDING SUPPORT TO THE
OCCUPATIONAL MEDICINE PROGRAM
 Core, Support, and Adjunct Faculty

Kurt Hegmann, M.D., MPH	Director, Occupational Medicine program; Director, Occupational Medicine Residency, course director for: <i>Occupational and Environmental Diseases, Occupational and Environmental Health Clinic</i> . Extensive research experience, broad clinical expertise, national reputation in occupational and environmental medicine.
Edward Holmes, M.D., MPH	Director of Occupational Medicine clinic, Course Director: <i>Applied Environmental Physiology and Occupational and Environmental Diseases 2001-2002</i> .
Royce Moser, Jr., M.D., MPH	Professor and Center Director, RMCOEH; Course director for Management, <i>Advanced Topics in Occupational & Environmental Medicine, Occupational Medicine Seminar, Health Care Administration (Occupational and Environmental Health and Safety)</i> ; member of student advisory committees. International reputation in occupational, environmental and aerospace medicine, including program management.
Anthony J. Suruda, M.D., MPH	Adjunct faculty, lecturer in RMCOEH Courses, Principal Investigator on research studies, recognized nationally as authority in occupational and environmental medicine.
Martin Caravati, MD, MPH	Clinical professor of emergency medicine and assistant director of the Utah Poison Center.

Lynn Martinez, MS	Director of the Pregnancy Risk Line, the teratology information service at the Utah Department of Health.
Mark Schiefer MD, MS	Adjunct assistant professor, consultant in the private practice of occupational and environmental toxicology. He provides consulting services to the OEM clinic concerning toxic tort litigation. He is also an expert in mushroom toxicology.
Paul Teynor, MD, MPH	Adjunct assistant professor, preceptor and chair of the RAC.

Preceptors	
Mark Anderson, M.D.	Preceptor, the Boeing Company preceptorship (3 credit hours or up to 4 weeks residency experience).
J. Michael Muhm, M.D., MPH	Preceptor, the Boeing Company preceptorship (3 credit hours or up to 4 weeks residency experience).
William H. Brady, III, M.D., MPH	Preceptor, Hanford preceptorship (3 credit hours or up to 4 weeks residency experience).
David Tipton, M.D.	Preceptor, NASA preceptorship (3 credit hours or up to 4 weeks residency experience).
Richard Melton, Dr.PH	Preceptor, Utah Dept. Of Health preceptorship (3 credit hours or up to 4 weeks residency experience).
Diane R. Nielson, Ph.D.	Preceptor, Dept. Of Environmental Quality preceptorship (3 credit hours or up to 4 weeks residency experience).
Richard E. Johns, Jr., MD, MSPH	Preceptor, ATK Aerospace Group preceptorship (3 credit hours or up to 4 weeks residency experience).
Loren Lewis, MD, MPH	Preceptor, Hill Air Force Base preceptorship (3 credit hours or up to 4 weeks residency experience).
Douglas Trout, MD	Preceptor, NIOSH preceptorship (3 credit hours or up to 4 weeks residency experience).

Mark Moore, MD	Preceptor, Dean Health Systems (3 credit hours or up to 4 weeks residency experience).
Grant Cannon, M.D.	Preceptor, the Veterans Administration Hospital preceptorship (3 credit hours or up to 4 weeks residency experience).
George Ruby, MD	Preceptor, OSHA preceptorship (3 credit hours or up to 4 weeks residency experience).
Tori Burns, CIH, MSPH	Preceptor, Utah OSHA/Labor Commission preceptorship (3 credit hours or up to 4 weeks residency experience).

Table OM-2

<u>Rotation Sites</u>	<u>City, State</u>
ATK Aerospace Group (Formerly Alliant TechSystems)	Magna, UT
The Boeing Company	Seattle, WA
Dean Health Systems	Madison, WI
Disability Determination Services	Salt Lake City, UT
Dominican Health Systems	San Jose, CA
Freeman Health Systems	Joplin, MO
Hanford Environmental Health	Richland, WA
Labor Commission	Salt Lake City, UT
NASA (National Aeronautics & Space Administration)	Kennedy Space Center, FL
NIOSH (National Institute of Safety & Health)	Cincinnati, OH
Occupational and Environ. Health Clinic, Hill Air Force Base	Ogden, UT
Office of Occupational Medicine, OSHA	Washington, DC
Puget Sound Naval Shipyard	Bremerton, WA
St. Mary's Hospital Occupational Medicine Dept.	Grand Junction, CO
University of California	San Francisco, CA
University of Utah Hospital	Salt Lake City, UT
Utah Dept of Environmental Quality	Salt Lake City, UT
Utah Department of Health	Salt Lake City, UT
Department of Veterans Affairs, Veterans Hospital	Salt Lake City, UT
WorkCare Clinic	Salt Lake City, UT

OM-3
NIOSH Training Grant Program Graduates

Grantee Institution: University of UtahAcademic Program: Occupational Medicine

Names Omitted due to University Policy	Date Entered Program	Date Program Completed##	Date Degree Awarded	Degree Received from Program###	Current Employment Status (Job title/employer)	Current Business Address (Or last known address)
E.H.**	August 1999	June 30, 2001	June 30, 2000	MPH	Clinic Director, Assistant Professor, UofUtah OccMed	75 So. 2000 East SLC, UT 84112
W.M.**	August 1999	June 30, 2001	June 30, 2000	MPH	Occ. Med. Physician Rehab Assoc. of Colo. Inc.	Harmony Med. Center 1330 Oakridge Ave. Ft. Collins, CO 80525
G.C.	September 1, 2000	August 31, 2001	N/A	N/A	Occ. Med. Physician Industrial Medical Group	3673 So. Polaris Ave. Las Vegas, NV 89103
I.D.	August 2000	June 30, 2002	June 30, 2001	MPH		
W.D.###	August 2000		June 30, 2001	MPH		
M.D.	August 1, 2001	July 31, 2002	N/A	N/A		
P.L.	August 2001		June 30, 2002	MPH		
B.Y.	August 2001		June 30, 2002	MPH		
D.D.	August 2001		June 30, 2002	MPH		

* Please specify by asterisk those Program graduates that did not receive NIOSH financial support.

##=For Occupational Medicine graduates use this column to specify date for certificate of completion of residency.

###=Minority.

N/A = Obtained MPH degree before entering program.

**Passed ABPM Board Certification examination

OCCUPATIONAL MEDICINE
APPENDICES

Appendix OM-1

Occupational Medicine

Bibliography by Calendar Year

Articles, Books, and Book Chapters

(Student Authors Underlined)

2000

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October, 2002

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ERGONOMICS AND SAFETY PROGRAM

ABSTRACT and OVERVIEW

At the end of the 2000 - 2002 grant period, the Ergonomics and Safety Program at the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) is even stronger than it was at the end of the 1995-2000 grant period. The addition of Dr. Seseck to the faculty in 1999, the presence of Dr. Thomas Bernard as a visiting professor, and the receipt of a NIOSH Occupational Injury Prevention training grant in 2002 has benefitted the Ergonomics and Safety Program through the expansion of both the research efforts and number of academic courses. (Please see Table E&S-1.) During the two years of this grant period there were six engineering program masters graduates, two Ph.D. graduates and four MSPH/MPH (non-NIOSH supported) graduates plus one industrial safety trainee who also completed the E&S core. (Please see E&S-1.) Ten journal articles were published or accepted, five book chapters published, and five refereed conference proceedings published. Over 100 hours of outreach activities were accomplished. The program continues to focus research on the NORA priority areas of musculoskeletal disorders, low-back disorders, and exposure assessment methods as well in addition to rehabilitation ergonomics.

SIGNIFICANT FINDINGS

The following is a summary of progress in accomplishing the overall goals for the Ergonomics and Safety Program for the 2000-2002 grant period.

Goal 1: Enhance the E&S Academic Program

Results: Accomplished: Two new human factors courses, ME 6960-1 (*Human Factors Engineering*) and ME 6960-2 (*Design Implications for Human-Machine Systems*) have been developed and taught. One additional course, ME 6960-4 (*Work Physiology and Occupational Heat Stress*) was developed and taught by Dr. Tom Bernard, and two additional courses, ME 6960-3 (*Engineering Control and PPE*), and ME 7960 (*Computer applications in Health and Safety*) are being developed. All E&S masters students are required to take a statistics course and E&S students continuing for a Ph.D. must take one epidemiology course and three additional statistics courses. Outreach activities, collaboration with other universities, and efforts to provide material to facilitate the integration of ergonomics and safety material into the undergraduate curriculum have been successful. Appendix E&S-1 lists students enrolled during the grant period.

Goal 2. Enhance the E&S Research Effort (noted separately in goals for Research Training in original grant application)

Results: Partially Accomplished. Funding was not received for the Ph.D. program in Ergonomics and Safety Research Training for the 2000-2002 grant period. However, a separate proposal for an Occupational Injury Prevention Research Training Ph.D. program was approved, and the first students entered the program in 2001.

Goal 3. Enhance E&S Service Efforts

Results Accomplished: Drs. Blosswick and Seseck made over 100 hours of outreach presentations, tours and activities during the two-year grant period.

Goal 4. Maintain interdisciplinary interaction between E&S and other RMCOEH Core programs.

Results: Accomplished. Drs. Blosswick and Seseck lecture extensively in other RMCOEH core programs and Drs. Hegmann (OM), Lillquist (IH), and Stephenson (IH) lecture in E&S courses. Drs. Blosswick and Seseck have collaborated with the OM Program on two grant submissions and collaborated with faculty/students from other RMCOEH cores on five accepted/published papers and three refereed conference proceedings. The University of Utah/University of South Florida (UU/USF) research effort will continue and Dr. Tom Bernard of USF is spending Autumn semester 2002 as a Visiting Professor in the UU E&S Program. Dr. Seseck has collaborated with faculty from Colorado State University and Montana Tech University on research grants.

BODY OF REPORT WITH CONCLUSIONS

Goal 1. Enhance the E&S Academic Program

Objective 1.a. Include a Human Factors Engineering Class in the E&S Graduate Program

Results: Accomplished. ME 6960-1 (*Human Factors Engineering*) was developed and taught Autumn semester 2000 and 2001. It will continue to be taught in alternate odd academic years by Dr. Sesek. In addition, Dr. Sesek has developed a second human factors course, ME 6960-2 (*Design Implications for Human-Machine Systems*) which is being taught Autumn, 2002. It will continue to be taught in even academic years by Dr. Sesek.

Objective 1.b. Increase Statistics/Experimental Design Course Work.

Results: Accomplished. All E&S masters students are required to take either FPMD 6100 (*Biostatistics*) or ESS 6560 (*Experimental Design and Analysis*). E&S students continuing for a Ph.D. must take either FPMD 6300 (*Epidemiology*) or FPMD 6303 (*Epidemiology of Injury and Violence*), a two-course statistics/experimental design sequence and one additional statistics course specifically related to their research.

Objective 1.c. Develop Five New CE Safety Courses (one per year)

Results: Partially Accomplished. Dr. Sesek has prepared and will present a new 4-hour continuing education course on Machine Guarding at this year's Annual Utah Conference on Health and Safety. As noted in the CE section, 27 courses with E&S emphasis, including ones presented more than once per year, were presented during the grant period. (It should be noted that the last two NIOSH site visit reports have suggested that Ergonomics and Safety Continuing Education efforts be moderated in favor of academic program development. Four new academic courses have resulted from this effort.)

Objective 1.d. Develop Two New Ergonomics Courses in the Five-Year Grant Period (one in 2000-2002).

Results: Accomplished. Dr. Blosswick developed and taught a new one-day course on compliance with the OSHA ergonomics standard in February, 2001 (approximately 100 attendees).

Objective 1.e. Provide Ergonomics Academic Training to Other State/Regional Universities without this Capability as E&S Outreach.

Results: Accomplished. Dr. Blosswick regularly lectures on ergonomics in the Industrial Hygiene Program at Utah State University. In Autumn 2002, he will provide an integrated sequence of separate lectures to the sophomore, junior and senior level IH students at Utah State University.

Objective 1.f. Increase Outreach Activities.

Results: Accomplished. Drs. Blosswick and Sesek provided over 100 hours of outreach activities in this grant period.

Objective 1.g. Develop Safety and Ergonomics Education Materials for Undergraduate Mechanical Engineering Courses as E&S Outreach. (See also objective 3a.)

Results: Accomplished. Modules have been developed for all ME undergraduate course content areas. These modules are available on the E&S Program Web site (under development at www.mech.utah.edu/ergo/). In addition, resource matrices for ME, EE and Civil Engineering faculty are available on the same site.

Objective 1.h. Develop safety and ergonomics training/research efforts with Training Program Grant faculty at Montana Tech University as E&S Outreach.

Results: Accomplished. During the grant period Dr. Roger Jensen and Julie Weber (Industrial Hygiene student) of Montana Tech University collaborated with Dr. Seseck and Ben Kempe (Ergonomics and Safety student) in a research project entitled "Investigation of Sensory Deficit Resulting from Finger Loading." This research was the basis for Mr. Kempe's Master's of Engineering Thesis. A manuscript from this work is currently being prepared for publication, and this work laid the foundation for a current study investigating finger loading, carpal tunnel pressure, prolonged flexion, and circulation occlusion. Previous collaborative research with Dr. Robin Herron and David Gilkey (Industrial Hygiene doctoral student) of Colorado State University and Dr. Seseck and Phillip Drinkaus (Ergonomics and Safety masters student) resulted in a manuscript submission during this grant period entitled "Evaluation and Quantification of Manual Material Handling Risk Factors."

Goal 2. Enhance the E&S Research Effort (Noted separately in goals for Research Training in original grant application.)

Results: Partially Accomplished. Funding was not received for the Ph.D. program in Ergonomics and Safety Research Training for the 2000-2002 grant year. Faculty submitted a separate proposal for a Ph.D. program in Occupational Injury Prevention Research Training that was approved. Initial students entered the program in 2001. This program, combined with the Ergonomics and Safety Research Training program that was approved for the 2002-2007 grant period, will significantly enhance all aspects of the E&S research program. Ten journal articles, five book chapters, and five conference proceedings were published or accepted during the 2000-2002 period.

Goal 3. Enhance E&S Service Efforts.

Objective 3.a. Provide ergonomics resources to meet local, state, and regional needs.

Results: Accomplished: Dr. Bloswick and Dr. Seseck made over 100 hours of outreach presentations, tours, and activities during the two-year grant period. This included 40 hours of volunteer work preparing lock out/tag out and confined space entry plans and training material for the Salt Lake Organizing Committee (Olympic Oval), lectures at regional universities, and presentations at regional, state and local professional conferences and meetings. Drs. Bloswick and Seseck also provide assistance to the OSHA Salt Lake Technical Center on web site ergonomics content, assistance to the Workers Compensation Fund of Utah in selecting scholarship recipients, and respond to technical questions on industrial safety and ergonomics from businesses in the intermountain west. Also, as part of the Occupational Safety and Health Field Trips class, Dr. Seseck provides technical guidance to participating companies regarding safety and health compliance and program issues.

Goal 4. Maintain interdisciplinary interaction between E&S and other RMCOEH Core programs.

Objective 4.a. Continue the interdisciplinary research effort with the University of South Florida. This involves field/plant research by interdisciplinary teams of members of E&S, OM, OHN, and IH cores from the two universities.

Results: Accomplished. An additional \$59,000 was received during the grant period and approximately \$20,000 additional is expected in Autumn 2002 to continue the UU/USF effort. Dr. Tom Bernard is spending Autumn semester 2002 as a visiting faculty in the UU E&S Program where he teaches one class and serves on E&S masters and Ph.D. committees. In addition, in 2002 Dr. Sesek prepared a manuscript based on collaborative efforts with Colorado State University (DHHS-CDC Pilot Project grant Dr. Robin Herron), and in 00/01 Dr. Sesek was the PI on a collaborative effort with Montana Tech University (DHHS-CDC Pilot Project grant--Dr. Roger Jensen).

Objective 4.b. Develop additional interdisciplinary research efforts with RMCOEH OM, OHN and IH cores.

Results: Accomplished. During the grant period Drs. Blosswick and Sesek collaborated with Dr. Hegmann, OM Program Director, on two grant submissions. Dr. Blosswick published one paper with Chris Silvia who graduated from the UU IH program but also completed the coursework required for the E&S emphasis. Dr. Blosswick published two papers with Kathy Sitzman an OHN in the Ph.D. program in the College of Health and co-authored two papers with Dr. Mark Coakwell, who graduated from the UU OM program, and Dr. Moser, RMCOEH Director. Drs. Blosswick and Sesek co-authored one refereed proceedings and one accepted paper with Dr. Tony Suruda, past RMCOEH OM Program Director. Dr. Sesek co-authored two refereed conference proceedings both of which included OM and IH faculty.

In addition, Drs. Lillquist and Stephenson (IH core) regularly lecture in M.E. 6110 (*Industrial Safety*) and in ME 6969-1 (*Human Factors Engineering*) and will lecture in ME 6960-3 (*Engineering Control and PPE*). Dr. Hegmann (OM core) regularly lectures in ME 6100 (*Ergonomics*) and BIOEN 6230 (*Musculoskeletal Functional Anatomy for Engineers*). Drs. Blosswick and Sesek regularly lecture in the following Public Health courses: FPMD 6702 (*Adv Topics in Occ/Env Medicine*), FPMD 6700 (*Environmental Health Problems*), FPMD 6740 (*Interdisciplinary Seminar in Safety and Health*), FPMD 6750 (*Occupational Safety & Health*), FPMD 6754 (*Noise & Other Physical Agents*), FPMD 6759 (*Occupational Safety & Health Field Trips*), FPMD 6707 (*Injury Surveillance*). Drs. Sesek (E&S) and Stephenson (IH) are co-directors of FPMD 6759 (*Occupational Safety and Health Field Trips*) which is now required of all E&S students.

Objective 4.c. Provide at least 10 contact lecture hours/year of ergonomics and safety lecture material for non-engineering programs within the University of Utah.

Results: Accomplished. Drs. Blosswick and Sesek have provided over 40 hours of lecture during the two-year grant period, an average of over 20 per year. In addition to the courses noted in 4b above, these include PHTH 6230 (*Orthopedic Rehabilitation*) (6 hours/year), PHYSL 51000 (*Carpal Tunnel Syndrome*), BIOEN 6230 (*Functional Musculoskeletal Anatomy for Engineers*), OCTH 6220 (*Occupational Therapy Occup. & Prac. Theory II*) (3 hours/year), OCTH 6260 (*Occupational Therapy Occup. & Prac. Eval II*) (3 hours/year), ME 1000 (*Design and Visualization*), ME 4010 (*Engineering Design II*).

Objective 4.d. Continue the strong interdisciplinary focus and collaborations of the E&S Program.

Results: Accomplished. In addition to the efforts noted in items 4b and 4c above, Drs. Blosswick and Sesek will continue to include faculty from the Industrial Hygiene and Occupational Medicine cores as well as faculty from other departments, such as Physiology and Psychology, in the new courses which are being developed. Most notably,

the “Engineering Control and Personal Protective Equipment” course will have numerous guest lectures by Industrial Hygiene faculty. Also, Dr. Sesek has been collaborating with Dr. Balaji (Mechanical Engineering) and Dr. Lillquist (Industrial Hygiene) to evaluate the health exposures related to “dry” cutting and machining operations. They just received a grant entitled “A Comparison of Aluminum-Silicate Particulate Exposure With and Without Cutting Fluids.”

CONCLUSION:

All goals and objectives were accomplished except that the goal to enhance the E&S research effort was partially accomplished (one Ph.D. program not approved but a second Ph.D. Research Training program was approved.) Twelve objectives were accomplished and one was partially accomplished. Twelve students graduated from the program during the grant period. There were five book chapters and ten papers published or accepted, and over 100 hours of outreach activities were accomplished.

TABLE E&S 1
ERGONOMICS AND SAFETY FACULTY
AND RESPECTIVE RESPONSIBILITIES/STRENGTHS

NAME	ACADEMIC COURSE RESPONSIBILITIES
Full-time E&S Faculty (2 x 1 = 2 FTE)	
Donald S. Blosswick, Ph.D., P.E., CPE Associate Professor Tenured (1.0 FTE)	Program Director, Primary responsibility is for academic courses ME 6100 (<i>Ergonomics</i>), ME 6110 (<i>Industrial Safety</i>), ME 7100 (<i>Advanced Ergonomics</i>), ME 7105 (<i>Advanced Ergonomics Laboratory</i>), ME 7110 (<i>Systems Safety</i>), and BIOEN 6230 (<i>Functional Anatomy for Engineers</i>); serves on student research committees; student advisor, participates in E&S qualifying exams..
Richard Sesek, MPH, Ph.D., CSP	Dr. Sesek teaches ME 6960-1, <i>Human Factors Engineering</i> , and co-directs FPMD 6759, <i>Health and Safety Field Trips</i> , with IH faculty. He will develop and teach: (1) ME 6960-3 (<i>Engineering Controls and Personal Protective Equipment</i>), and (2) ME 6960-4 (<i>Work Physiology and Occupational Heat stress</i>). Assuming that NIOSH funding for the Ph.D. program is approved, he will develop and teach: (1) ME 6960-2 (<i>Design Implications for Human-Machine Systems</i>), and (2) ME 7960 (<i>Computer Applications in Health and Safety</i>). He also lectures in ME 6100, <i>Ergonomics</i> and ME 6110, <i>Industrial Safety</i> .
Full-time Faculty with Primary Course Responsibility (3 x .10 = .30 FTE) (not including Dr. Bernard)	
Thomas Bernard, Ph.D., CIH, PE, CPE	Serves on E&S Ph.D. committees and will be responsible for M.E. 6960-4 (<i>Work Physiology and Occupational Heat Stress</i>). Dr. Bernard is a Professor of Environmental and Occupational Health at the University of South Florida. He is an international expert in the areas of ergonomics and evaluation and management of occupational heat stress..
David Hoepfner, Ph.D., PE	Serves on and chairs E&S graduate committees and teaches ME 6030 (<i>Reliability</i>) and ME 6040 (<i>Quality Assurance</i>). Dr. Hoepfner is world renown for his work on aircraft reliability and failure analysis.
Robert P. Tuckett, Ph.D.	Developed and teaches PHYSL 5100 (Carpal Tunnel Syndrome) and serves on M.S. and Ph.D. Committees. Dr. Tuckett is a Professor of Physiology at the University of Utah and an expert in the development of carpal tunnel syndrome symptoms test methodologies.
Carolee Moncur, Ph.D., RPT	Primary lecturer in BIOEN 6230 (<i>Functional Musculoskeletal Anatomy for Engineers</i>). Dr. Moncur is a national expert in arthritis, rehabilitation, and functional musculoskeletal anatomy.

Other Faculty and Staff (8 x .05 = .45 FTE)	
Sanford Meek, Ph.D.	Serves on E&S graduate committees, assists with the E&S Ph.D. Qualifying Exam, and lectures in BIOEN 6230 (<i>Functional Musculoskeletal Anatomy for Engineers</i>). Dr. Meek is an expert in engineering control of prosthetic and orthotic devices.
Gary Sandquist, Ph.D., PE	Serves on E&S graduate committees.
Charles Elliott, Ph.D., PE	Serves on graduate committees and is co-director of the program to integrate safety and ergonomics into the undergraduate mechanical engineering curriculum.
Byron Hardy, Ph.D., CSP	Lectures in ME 6110 (<i>Industrial Safety</i>) and serves on E&S graduate committees. Dr. Hardy has particular expertise in radiation safety.
Patrick Veillette, Ph.D.	Assists with the development of and lectures in ME 7110 (<i>Systems Safety</i>). Dr. Veillette is a commercial pilot with expertise in flight safety and accident/injury analysis in forest fire fighters and smoke jumpers.
Bob Ford, B.S.	Lectures in ME 7110 (<i>Systems Safety</i>). Mr. Ford is a national expert in advanced systems safety analysis techniques.

ERGONOMICS AND SAFETY
APPENDICES

APPENDIX E&S-1
NIOSH TRAINING GRANT PROGRAM TRAINEES APPOINTED
Academic Year 7/1/00 to 6/30/02

Grantee Institution: University of Utah

Academic Program: Ergonomics and Safety

Names Omitted due to University Policy (Initials used instead of names)	Date Entered Program	Degree Received from Program###	Date Graduated Program Completed	Reason if Premature Termination	Current Employment Status (Job title/employer)	Current Business Address (Or last known address)
M.B.*	8/96	M.P.H.	8/00	N/A	801-288-8303-W	2935 W. 1060 N. Provo, UT 84601
C.S.** (ESEC)	8/98	M.S.P.H.	8/00	N/A	MPA student at Brigham Young University	652 N. 1000 East Orem, UT 84097
J.Z.* (ESEC)	9/95	Ph.D.	5/01	N/A	Staff Engineer, Flow International Corp.	Flow International Corp. 23500 64th Ave., South Kent, WA 98032
M.K.*	8/96	Ph.D.	5/01	N/A		Moved to California w/ Sister 61 Nighthawk Irvine, CA 92604
N.S.	8/99	M.S.	5/01	N/A	Quality Engineer, Medron, Inc.	Medron, Inc. 1518 South Gladiola St. Salt Lake City, UT 84104
B.W.*	9/99	MS.P.H.	5/01	N/A	Field Quality, Safety, Health and Environmental Specialist, Schlumberger	Schlumberger Prudhoe Bay Point Barrow, Alaska and 275 E. Dowling Street, #8 Anchorage, Alaska
R.B.	9/97	M.S.	12/01	N/A	Engineer, Pride Mobility	Pride Mobility 330 Philadelphia Ave. West Pittston, PA 18643

* = Please specify by asterisk those Program graduates that **have not received** NIOSH financial support.

** = Please specify by double asterisk those Program graduates that **have not received** NIOSH financial support from the E&S program, **but have received** NIOSH financial support from the IH program.

ESEC = Students who took all E&S engineering courses.

Names Omitted due to University Policy (Initials used instead of names)	Date Entered Program	Degree Received from Program###	Date Graduated Program Completed	Reason if Premature Termination	Current Employment Status (Job title/employer)	Current Business Address (Or last known address)
P.D.	1/98	M.S. (Continue for Ph.D.)	12/01 5/03 (exp)	N/A	Student	Mechanical Engineering 50 S. Central Campus Dr., Rm 2202 SLC, UT 84112-9208
K.J.	8/99	M.S.	12/01	N/A	Student, Intern, Safety Management Services	Mechanical Engineering 50 S. Central Campus Dr., Rm 2202 SLC, UT 84112-9208
S.S. (ESEC)	9/99	M.S.	—	Moved to different program due to lack of funding for foreign students	Student	Mechanical Engineering 50 S. Central Campus Dr., Rm 2202 SLC, UT 84112-9208
B.K.	1/00	M.S.	12/01	N/A	Mechanical Engineer Bechtel National, Inc.	Bechtel National, Inc. 2952 George Washington Way, #12 Richland, WA 99352
M.W.	1/00	M.S. (Continue for Ph.D.)	12/01	N/A	Student	566 South 1300 East Salt Lake City, UT 84102
M.N.*	8/97	M.P.H.	5/02	N/A	nelson54321@aol.com	Mechanical Engineering 50 S. Central Campus Dr., Rm 2202 SLC, UT 84112-9208

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** = Please specify by double asterisk those Program graduates that **have not received** NIOSH financial support from the E&S program, **but have received** NIOSH financial support from the IH program.

ESEC = Students who took all E&S engineering courses.

Names Omitted due to University Policy (Initials used instead of names)	Date Entered Program	Degree Received from Program###	Date Graduated Program Completed	Reason if Premature Termination	Current Employment Status (Job title/employer)	Current Business Address (Or last known address)
T.M.		M.E.	12/02 (exp)	N/A	Professor, Salt Lake Community College	Salt Lake Community College 1932 S. Texas Street SLC, UT 84108
G.L.	10/96	M.S.	12/02 (exp)	N/A	Engineer F-16 Power Systems Hill AFB	Engineer F-16 Power Systems Hill AFB 00-ALC/LIPE 6041 Gum Lane Hill AFB, UT 84056-5826
S.M.	8/90	M.S.	12/02 (exp)	N/A	Professor, Salt Lake Community College	Salt Lake Community College 1932 S. Texas Street SLC, UT 84108
L.B. (ESEC)		M.E.	5/03 (exp)	N/A	ATK Thiokol Propulsion	ATK Thiokol Propulsion P.O. Box 0673 Bountiful, UT 84011
K.W. (ESEC)	8/99	M.E.	5/03 (exp)	N/A	Chemical/Manufacturing Engineer ATK Thiokol Propulsion	ATK Thiokol Propulsion P.O. Box 0673 Bountiful, UT 84011
B.R.	8/99	Ph.D.	12/03 (exp)	N/A	Student	Mechanical Engineering 50 S. Central Campus Dr., Rm 2202 SLC, UT 84112-9208
G.W. (ESEC)	8/00	M.E.	5/02 (exp)	N/A	Mechanical Engineer, FMC Technologies	FMC Technologies 3100 S. Pennsylvania Ave. Ogden, UT 84401

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** = Please specify by double asterisk those Program graduates that **have not received** NIOSH financial support from the E&S program, **but have received** NIOSH financial support from the IH program.

ESEC = Students who took all E&S engineering courses.

Names Omitted due to University Policy (Initials used instead of names)	Date Entered Program	Degree Received from Program####	Date Graduated Program Completed	Reason if Premature Termination	Current Employment Status (Job title/employer)	Current Business Address (Or last known address)
B.M.	7/01	Ph.D.	5/04 (exp)	N/A	Safety and Rehabilitation Consultant, Self Employed	1204 South 900 East, Apt. C Salt Lake City, Utah 84105-1357
A.H.	8/01	M.S.P.H.	5/03 (exp)	N/A	Student	623 University Village SLC, UT 84108
R.W.	8/01 (readmit)	M.E.	5/03 (exp)	N/A	roger.warnes@hill.af.mil student 801-775-2091	1582 Mountain Road Ogden, Utah 84404 801-392-3641
S.R.	9/01	M.S.	5/03 (exp)	N/A	Mechanical Engineer Intern, Iomega Corp.	Iomega Corporation 1821 West Iomega Way Roy, Utah 84067
M.W.	1/02	Ph.D.	5/04 (exp)	N/A	Student	566 South 1300 East Salt Lake City, UT 84102
E.G.	5/02	Ph.D.	5/04 (exp)	N/A	Student	2163 Lorita Way Sandy, UT 84093
M.R.	6/02	M.S.	5/04 (exp)	N/A	Student	Mechanical Engineering 50 S. Central Campus Dr., Rm 2202 SLC, UT 84112-9208

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- * = Please specify by asterisk those Program graduates that **have not received** NIOSH financial support.
- ** = Please specify by double asterisk those Program graduates that **have not received** NIOSH financial support from the E&S program, **but have received** NIOSH financial support from the IH program.
- ESEC = Students who took all E&S engineering courses.

Continuing Education/Outreach Program

ABSTRACT and OVERVIEW

The Continuing Education (CE) program was established as part of the original University of Utah's Educational Resource Center (ERC - now designated as Education and Research Center) grant in 1978. The program continues its mission to reduce human and financial costs by providing excellent short-course training in occupational safety and health that is marked by continuous improvement and response to needs, setting the highest standards for both internal and external service. During the 2000-2002 grant period, there were 4028 students enrolled in 165 CE courses presented by the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH), the University of Utah's ERC.

The program is supported by a broad base of faculty, both internal and external, to accomplish its stated goals: 1) Offer continuing education programs (courses and conferences) to occupational and environmental health and safety professionals and to others involved in the field; 2) Conduct research to identify training needs and training effectiveness; 3) Engage in service activities that enhance and promote the field of occupational and environmental safety and health; and 4) Maintain interdisciplinary collaboration in education, research, and service.

SIGNIFICANT FINDINGS

The following is a summary of progress in accomplishing the overall goals for the continuing Education (CE) program for the 2000-2002 grant period:

Goal 1: Offer continuing education programs (courses and conferences) to occupational and environmental health and safety professionals and to others involved in the field

Results: Accomplished. During the grant period, 165 courses, including 46 new courses, were presented to 4028 registrants. This was achieved through five major objectives: 1) Provide short-term occupational safety and health post-graduate training (2 per discipline) on current OEHS issues and topics to at least 900 participants/year; 2) Provide multi-disciplinary conferences to promote interaction among professionals in all fields of occupational safety and health. These conferences included the Annual Utah Conference on Safety and Industrial Hygiene, the Annual Workers Compensation Forum and the Governor's Conference on Worksite Wellness; 3) Facilitate exchange with other safety and health professionals through course co-sponsorship with other organizations involved in occupational safety and health. Co-sponsors included the Utah Safety Council; the local Chapter of the American Industrial Hygiene Association; the local Chapter of the American Society of Safety Engineers; the Utah Council for Worksite Health Promotion; Intermountain Health Care; the University of Wisconsin at Milwaukee; the University of New Mexico; the National Jewish Medical and Research Center; and the High Plains Intermountain Center for Agricultural Health and Safety. 4) Obtain highly qualified faculty from the private and public sector who bring both theoretical and practical knowledge to the issues presented and 5) Hold at least one course per year in either Colorado, Wyoming, Montana, or Eastern Idaho. During the 2-year grant period, courses were held in Wyoming and Idaho.

Goal 2: Conduct research to identify training needs and training effectiveness

Results: Accomplished. During the grant period, the CE Program implemented an extensive needs assessment program. This was achieved through one major objective: 1) To research the needs of each state within the Center's designated region by needs assessment surveys and questionnaires. Needs information was collected from standard needs assessment surveys and course evaluation forms placed in participants' course packets. Training effectiveness was measured through both post-course surveys and impact evaluations. Specific topic assessments were also accomplished. These include: 1) Need for courses in Spanish; 2) Need for MSHA training; and 3) Health and wellness training needs.

Goal 3: Engage in service activities that enhance and promote the field of occupational and environmental safety and health

Results: Accomplished. Two objectives were identified as means to achieve this goal: 1) Increase awareness and understanding of occupational safety and health issues throughout the region; 2) Support activities that serve the needs of the target populations. During the grant period, the Center exhibited at national and regional association meetings in an effort to expand notification of courses and identify potential training candidates. The CE program has expanded its correspondence course offerings to reach a more diverse audience and initiated the Industrial Hygiene Certificate Program (supplements the Safety Certificate Program), designed to reach a nighttime audience. Also, during this period, two correspondence courses were converted to online offerings. Center core faculty also participated in extensive outreach activities, including assistance to schools within the parent institution, schools outside the parent institution, professional societies and associations through

presentations, lectures and awareness seminars. Finally, although funding limitations have restricted active implementation of the “Occupational Health Lecture Series”, Cecile Rose, MD from the University of Colorado School of Medicine presented in September 2000.

Goal 4: Maintain interdisciplinary collaboration in education, research, and service.

Results: Accomplished. The sole objective of this goal was to engage in activities that support interaction that crosses all disciplines. Interdisciplinary in nature, continuing education courses attract attendees that cross all core disciplines. This effort has been facilitated by organizing efforts that bring different disciplines together. For example, the Annual Utah Conference on Safety and Industrial Hygiene unites industrial hygiene and safety associations who assist in organizing the conference. Many nurses attend occupational medicine courses and safety professionals support the Workers Compensation conference, an effort primarily directed to insurance and occupational medicine practitioners.

BODY OF REPORT WITH CONCLUSION

As Indicated in the Summary of Significant Findings section, four goals were established for the continuing Education (CE) Program. Specific objectives were established for each goal. The following details the progress in accomplishing these objectives

Goal 1: To offer continuing education programs (courses and conferences) to occupational and environmental health and safety professionals and to others involved in the field.

Objective 1.a: To provide short-term occupational safety and health post-graduate training (2 per discipline) on current issues and topics to a minimum of 900 participants/year.

Results: Accomplished. At the end of the two-year grant period, 165 courses were presented to 4028 participants. The program has met the requirement that two short-term post-graduate courses be conducted in each of the core disciplines.

1. Total number of Continuing Education courses presented during the grant period:

2000-2001:	72
2001-2002:	<u>93</u>
Total	165

2. Total number enrolled in Continuing Education courses during the grant period:

2000-2001:	1881
2001-2002:	<u>2141</u>
Total	4028

3. Number of courses presented by Core Disciplines:

- a. Industrial Hygiene

2000-2001	11
2001-2002	<u>14</u>
Total	25

- b. Occupational Medicine

2000-2001	8
2001-2002	<u>13</u>
Total	21

- c. Occupational Health Nursing

2000-2001	3
2001-2002	<u>5</u>
Total	8

d.	<u>Ergonomics and Safety</u>	
	2000-2001	14
	2001-2002	<u>13</u>
	Total	27
e.	<u>Hazardous Substances</u>	
	2000-2001	15
	2001-2002	<u>16</u>
	Total	31
f.	<u>Asbestos</u>	
	2000-2001	19
	2001-2002	<u>24</u>
	Total	43
g.	<u>Lead</u>	
	2000-2001	2
	2001-2002	<u>8</u>
	Total	10

4. Number of new continuing Education courses presented during the grant period:

Forty-six new courses were developed and offered during the 2000-2002 grant period. Many of the courses will also be offered in the next grant period. See Appendix CE-1 for complete listing.

Objective 1.b: To provide multi-disciplinary conferences to promote interaction among professionals in all fields of occupational safety and health.

Results: Accomplished. The CE program, again, actively supported the Annual Utah Conference on Safety and Industrial Hygiene during this grant period. Other multi-disciplinary conferences that drew RMCOEH CE support include the Annual Workers Compensation Forum and the Utah Council for Worksite Health Promotion Wellness Conference. Each of these conferences drew from 100 - 300 people, representing a significant amount of effort and response.

Objective 1.c: To facilitate exchange with other safety and health professionals through course co-sponsorship with other organizations involved in occupational safety and health.

Results: Accomplished. During the grant period, the RMCOEH CE program collaborated with a number of other organizations that promote occupational safety and health. These include the local Chapter of the American Society of Safety Engineers, the local Section of the American Industrial Hygiene Association, the Utah Safety Council, and the Labor Commission of Utah (recently added as a co-sponsor) who, collectively, plan and conduct the Annual Utah Conference on Industrial Hygiene. Each year, the RMCOEH CE program co-sponsors a course with the Utah Association of Occupational Health Nurses. Also, during this grant period, the RMCOEH collaborated with the University of New Mexico, the National Jewish Medical and Research Center, and the High Plains Intermountain Center for Agricultural Health and Safety in offering a Regional Issues in Occupational and Environmental Health for Primary Care Providers course in Durango, Colorado. Occupational

Medicine Grand Rounds are now co-sponsored with Intermountain Health Care. Finally, the worksite wellness conference is developed and conducted with the Utah Council for Worksite Health Promotion. (See Appendix CE-2 for a listing of recent collaborators.)

The RMCOEH participated in an initiative funded by the Labor Commission of Utah. Fifty-percent tuition waivers were awarded to small to medium sized businesses who are establishing new, or enhancing existing, safety programs.

Objective 1.d. To obtain highly-qualified faculty from the private and public sector who bring both theoretical and practical knowledge to the issues presented.

Results: Accomplished. In addition to RMCOEH faculty, the CE Program draws course instructors from a cadre of qualified individuals. This has provided a depth and breadth of instruction that enhances both the quality and reputation of Center courses.

These additional speakers have come from other universities, government agencies, and private industry. (See Appendix CE-3 for a representative annual faculty list.)

Objective 1.e. To hold at least one course per year in either Colorado, Wyoming, Montana, or Eastern Idaho.

Results. Accomplished. During the grant period, the RMCOEH conducted a Pulmonary Function Testing course, two Emergency Responder courses, and two asbestos courses in Wyoming. One asbestos course was also offered in Idaho. Finally, a seminar addressing regional issues in occupational and environmental health for primary care providers was offered in Durango, Colorado.

Goal 2. Conduct research to identify training needs and training effectiveness.

Objective 2.a.: To research the needs of each state within the Center's designated region by needs assessment surveys and questionnaires.

Results: Accomplished. The CE Program implemented an extensive needs assessment program during the 2000-2002 grant period. Needs information was routinely gathered from the standard needs assessment surveys and course evaluation forms placed in participants' course packets. In addition, training effectiveness was measured through post-course surveys as well as impact evaluations distributed in connection with the Utah Labor Commission fee waiver program. The RMCOEH also has a needs survey on its website. Specific topic assessments were a focus in this grant period. The following areas were targeted for needs analysis: 1) Training in Spanish; 2) MSHA training; and 3) Health and Wellness training.

Goal 3. Engage in service activities that enhance and promote the field of occupational and environmental safety and health.

Objective 3.a.: Increase awareness and understanding of occupational and environmental safety and health issues throughout the region.

Results. Accomplished: The CE Program continued to support the "Occupational Health Lecture Series". However, this was done on a very limited basis due to limited funding. During the 2000-2002 period, the following lecturers participated in this series:

Name:

Cecile Rose, MD

Affiliation

University of Colorado School of Medicine

A proposal has been submitted to a local foundation for support of a lecture series. In addition, the Center exhibited at national and regional association meetings. The CE program also engages in a variety of marketing efforts to disseminate course information. This includes listings in association journals as well as collaborating with the University Health Sciences Center departments, including the Area Health Education Center, to ensure widespread notification of upcoming programs.

As noted previously, a seminar specifically addressing regional needs of occupational safety and health issues directed to primary care providers was offered in Durango, Colorado in September 2001.

Objective 3.b: Support activities that serve the needs of the target populations.

Results: Accomplished. The CE programs has focused on marketing to occupational and environmental safety and health professionals through announcements in trade association journals as well as advertising in several key journals. In addition, the RMCOEH maintains a dynamic in-house list that is augmented with lists purchased from pertinent trade associations. These activities are supplemented through Internet marketing that includes an electronic newsletter where courses are posted to electronic mailing lists affiliated with the occupational and environmental safety and health community. Brochures can be easily downloaded from the RMCOEH web site, providing real-time access to course offerings.

The CE Program has made a concerted effort over the grant period to identify alternative ways to meet the needs of the target populations. The number of correspondence courses has expanded from four to twelve with two offerings available online. Pursuant to the success of the Safety Certificate Program, the RMCOEH implemented an Industrial Hygiene Certificate Program; the certificate programs are unique in that they recognize that it is difficult for many business people to attend day classes, so courses are offered at night, one night per week over an 8-week period.

Upon request by a local environmental firm, RMCOEH offered both an 8-hour Hazwoper refresher course and a 24-Hour Emergency Response course in Spanish on contract.

When sufficient requests are received, either by phone or through a formal needs assessment, the RMCOEH makes every effort to accommodate the request. The Leadership/Management and Indoor Mold courses have all been added to the schedule in response to such needs.

RMCOEH graduate students are allowed to attend all continuing education courses at cost. This is an added benefit to the student and reflects the commitment of the CE program to the efforts of the academic cores.

Center core faculty participated in extensive outreach activities including assistance to schools within and outside the parent institution. They also gave presentations, lectures, and awareness seminars to professional societies and associations.

Finally, tuition assistance is, and will continue to be, provided to promote awareness of occupational safety and health issues to those agencies or organizations that would otherwise be unable to attend because of funding constraints.

Goal 4. Maintain interdisciplinary collaboration in education, research, and service.

Objective 4.a.: Engage in activities that support interaction that crosses all disciplines.

Results: Accomplished. RMCOEH continuing education courses support interaction that crosses all disciplines. Course or conference organizing efforts often pull different disciplines together. For example, the Annual Utah Conference on Safety and Industrial Hygiene unites industrial hygiene and safety associations who work together to organize the conference. Both safety and occupational health nurses support the Worksite Wellness conference and physicians support the Workers Compensation seminar, which is primarily targeted to insurance and safety practitioners.

CONCLUSION:

The four goals specified for the CE program were fully accomplished. Of the 9 objectives specified in support of these goals, all were accomplished. Although, per year, the program experienced a fluctuation in enrollments, the CE Program still met the goal of training at least 900 participants annually. A total of 4028 students attended the 165 courses presented. Of the total presented, forty-six courses were new. Programs were structured to support the program's mission, and all aspects of the program were continuously evaluated to ensure timeliness and relevance.

CONTINUING EDUCATION
APPENDICES

APPENDIX CE-1

New Courses Developed and Offered During the 2000-2002 Grant Period

Asbestos Courses

Asbestos Abatement for Project Designers

Hazardous Substances Courses

24-Hour Emergency Response (Spanish)
Applied Industrial Hygiene for Hazardous Substances Workers
Hazardous Materials: Chemistry Fundamentals*
Hazardous Waste Management**
Universal Waste Management Simplified

Lead Courses

No new courses

Industrial Hygiene Courses

Air Sampling**
Emergency Responder Training**
Environmental Law - An Overview & Case Studies**
Exposure Monitoring & Data Analysis*
Fundamentals of Industrial Hygiene (Correspondence Course)
Indoor Air Quality
Indoor Mold Issues: An Overview
Indoor Mold: Inspecting and Assessing the Risk*
Indoor Mold: Choosing the Proper Remediation*
Introduction to Industrial Hygiene: Professional Practice & Ethics*
Managing a Hearing Conservation Program**
Principle-Centered Leadership**
Physical Hazards in the Workplace*
Radiation Rules Facts & Myths**

Occupational Health Nursing Courses

From Fundamentals to Expert in Occupational Health Nursing
Physical Assessment Skills in the Workplace*

Occupational Medicine Courses

Annual Meeting of the RMAOEM
Applied Ergonomics: Low Back
Applied Ergonomics: Upper Extremity
Commercial Driver/Medical Examiner Course
Health Alert Network Video Conference*
Impact Testing & Success Rates for Upper Extremity Musculoskeletal Disorders
Regional Issues in Occupational and Environmental Health for the Primary Care Provider

Safety Courses

Behavioral Processes & Workplace Culture**
Competent Person/Scaffold Builder**
Confined Space Entry**
Contingency Planning/Continuation of Business Operations**
Electrical Safety for Construction Sites**
Emergency Preparedness for Hospitals**
Fall Protection**
Fire and Life Safety**
Leadership, Management and Business Skills for the Environmental, Safety & Health Professional*
Final Ergo Standard: Program Elements & Analytical Tools
Rules & Tools: Ergonomic Principles & Analytical Methods
Safety & Health Programs**
Total Quality Management for Health & Safety Professional (Correspondence Course)*
Trenching/Excavation**
Understanding and Managing Legal Issues in Safety & Health (Correspondence Course)*
Violence in the Workplace**
Wire Rigging**

*courses which will also be offered in the next grant period

**courses developed specifically in conjunction with the Annual Utah Conference on Safety and Industrial Hygiene

APPENDIX CE-2	
Collaborative Affiliations	Collaborative Event
University of Utah School of Medicine	Correspondence Course in Management of occupational and environmental health and safety programs.
High Plains Intermountain Center for Agricultural Health and Safety	Regional Occupational Issues for Primary Care Provider conference
Labor Commission of Utah	Fee Waiver Program for Utah businesses
National Jewish Medical and Research Center	Regional Occupational Issues for Primary Care Provider conference
University Network for Environmental Training (UNET)	Certificate Program
University of Mew Mexico	Regional Occupational Issues for Primary Care Provider conference
University of Wisconsin at Milwaukee	Regional Occupational Issues for Primary Care Provider conference
Utah Association of Occupational Health Nurses	Annual nursing short courses
Utah Chapter of ASSE	Annual Utah Conference
Utah Governor's Council for Worksite Health Promotion	Worksite Wellness Conference
Utah Section of AIHA	Annual Utah Conference
Utah Safety Council	Annual Utah Conference

APPENDIX CE-3

RMCOEH
Continuing Education Faculty
(other than full-time RMCOEH faculty)

Asbestos

Russell Baker - Thermal West
Merlynn Densley - IHI Environmental
Terry Grossaint - Granite School District
Randy Haslam - District Architect, Jordan Schools
Robert Lavery -
Eldon Romney - R&R Consultants
Dave Roskelley - R&R Consultants
Jeff Rowland - Consultant
Representative - Utah State Division of Air Quality
R.J. Sartori - President, Thermal West Industrial Inc.
Jeff Throckmorton - University of Utah EH&S

Hazardous Substances

Dave Allison - Delta Airlines
Corey Andrew - Consultant
Rush Bowers - IHI Environmental
Tori Burns - Labor Commission of Utah
Dan Crane -USDOL/OSHA
Mark Dumas - Salt Lake Community College
Kim Heimsath - Questar
Grantley Martelly - Utah Transit Authority
Mark Millett - Utah Highway Patrol
Dave Milligan - Consultant
Matt Morrison - Salt Lake City Fire Department
Robert T. Ziegler - IHI Environmental

Industrial Hygiene

David Bernhardt - State of Utah Radiation Control
Rob Brock - Larson Davis
Tori Burns - USDOL/OSHA
Jeff Burton - IVE, Inc.
Bill Craig - Utah Division, Radiation Control
Robert Curtis - Director, HRT, USDOL/OSHA
Noel deNevers - Engineering, University of Utah
Debbie Dietrich - SKC, Inc.
Mark Dumas - Salt Lake Community College
Keith Garber - University of Utah
Jerry Ferguson - Utah Farm Bureau
Nancy Fox - Weber State University
Kirk Freeman - Consultant
Lee Hathon - USDOL/OSHA
Warren James - Olympic Public Safety Command
Richard Lawrence - USDOL/OSHA
Grantley Martelly - Martelly & Associates
Brian Mauldwin - Circle Four Farms
Colleen McCarthy - IHI Environmental
James H. Nelson, Ph.D. - DataChem Laboratories
John Nicoletti - Consultant
Robert Partner - Labor Commission of Utah
James Reading - Statistician
Shaheen Safiullah - Utah OSHA
Diane Stewart - SWC Consultants
Stephen Straughn - Steven Straughn Associates
Ken Swallow - Circle Four Farms
Jeff Throckmorton - University of Utah
Aaron Trippler - AIHA
David Wallace - Utah State University
Kenneth White - IHI Environmental
Robert Ziegler - IHI Environmental

Lead

Rush Bowers - IHI Environmental
Dave Roskelley - R&R Consultants
Amir Karamati - IHI Environmental
Kurt Salomon - Radon
Kenneth White, MS, MSPH, CIH - Senior Partner, IHI, Inc.

Occupational Medicine

Henry Chai - Blackburn & Stoll
John English - St. Mark's Pain Management
Bibi Gottschall - National Jewish Medical & Research Center
Sharri Falkenburg - AON Ergonomic Services
Arun Garg - University of Wisconsin - Milwaukee
John Irvin - Lifestyle Enhancement Services
David James - University of New Mexico
Denece Kesler - University of New Mexico
David J. Kuntz - Northwest Toxicology
Don Martin - HealthSouth
Patrick McKinney - University of New Mexico
Brian T. McMahon - Virginia Commonwealth University
J. Steven Moore - Texas A&M University
Karen Mulloy - University of New Mexico
Karen Pacheco - National Jewish Medical & Research Center
Cecile Rose - National Jewish Medical & Research Center
Del Sandfort - High Plains Intermountain Center for Agricultural Health & Safety
William Shaw - Integrated Health Management
Brit Todd - High Plains Intermountain Center for Agricultural Health & Safety
Roy Trawick - Orthopedic Specialty Hospital
Cynthia Lewis-Younger - Oregon Poison Center

Occupational Health Nursing

Francie Barber - SWC Healthworks
Sherrie Bingham - Forest Service
Kathy Black - Salt Lake Industrial Clinic
Doug Burgoyne - IHC Health Plans
Tim Butler - IHC Health Plans
Leslie Clapham - Williams/BD Medical Systems
Pam Cronin - SWC Consultants
Dee Eddington - University of Michigan
Dianna Hasselfeld - Varian Medical Systems
Robert Kirby - Salt Lake Tribune
Connie Kirkpatrick - O.C. Tanner Company
Linda Leeper - Moog Aircraft
LaDonne Loveday - Becton Dickinson
Kelly Miller - Dietician
Linda Morris - State Health Department
Sterling Peterson - Bridgerland Applied Technology Center
Jan Smith - Questar
Cathy Sneyd - Delta
Diane Stewart - SWC Consultants
Sharon Strickland - Franklin Covey
Dean Witherspoon - Health Enhancement Systems
Douglas Younker - ICON Health & Fitness

Safety

Bill Adams - Utah OSHA
Travis Anderton - Becton Dickinson
Katherine Armstrong - Dalloz Safety
Tim Badberg - United Rentals
Pamela Baptiste - USDOL/OSHA
John Campbell - Consultant
Steve Chen - Thermal Ceramics Inc.
Dan Christiansen - Safway Scaffolding
Ray Court - ICM Equipment
Dave Daniels - St. Paul Fire & Marine Insurance
Jim DeMoux - Kanten Communications
Kirk Freeman - Consultant
Andrew Frink - Drooartz
Bruce Holmes - Utah Motor Carriers
Bob Kelleher - Utah Motor Carriers
Robert Kirby - Salt Lake Tribune
Howard Leaman - IHC Health Services to Business
J. Mac Lund - Salt Lake county Fire Department
Kris McBride - Utah Transit Authority
Liane Monroe - Depart of Veteran Affairs
Barbara Mooney - University of Utah
John A. Palmer - Scaffold Training Institute
F. David Pierce - Alliance for Training, Inc.
Becky Richards - Lobbyist
Paul Seager - Utah Department of Human Services
Craig Shur - Shur Sales & Marketing
Kathy Sitzman - Occupational Health Nurse
Mike Smith - Utah Fire/Rescue Academy
Curtis Snow - Nature's Sunshine Products
Stephen Stillwell - Center for Management & Organizational Effectiveness
Paul Teynor - Intermountain MRO Services
Eldon Tryon - Labor Commission of Utah
Mack Turner - Consultant
Tom Wachter - ARUP Laboratories
Jason Waterson - ICON Health & Fitness
Bruce Williams - Performance Technologies
Kurt Zimmerman - Murray City Corporation
Jay Ziolkowski - Salt Lake County Fire Department

HAZARDOUS SUBSTANCE TRAINING PROGRAM

ABSTRACT and OVERVIEW

The Continuing Education (CE) program at the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) was established in 1978 as part of the original ERC grant. The RMCOEH received funding in 1990 to develop Hazardous Substance Training (HST) CE courses, and courses have been ongoing since that time. This training is also part of the overall CE program's mission to reduce human and financial costs by providing excellent short-course training in occupational and environmental health and safety that is marked by continuous improvement and response to needs. During the 2000-2002 grant period, 442 students enrolled in 31 HST CE courses.

The NIOSH HST target audience includes professionals in state and local government agencies, as well as other professionals engaged in the handling of hazardous substances or the management of facilities involved in hazardous substances-related activities. Therefore, Center courses have targeted individuals that include emergency response personnel, engineers, and consultants who may be required to periodically access hazardous waste sites or be involved in responding to chemical incidents and, thus, potentially be exposed to health and safety hazards.

The HST program operated under three stated goals:

- 1) Offer continuing education programs (courses and conferences) to professionals involved in the hazardous substances field.
- 2) Conduct research to identify training needs and training effectiveness.
- 3) Engage in service activities that enhance and promote the field of hazardous substances.

Specific objectives were identified to achieve these goals. The goals and the objectives are detailed in subsequent sections of this report.

SIGNIFICANT FINDINGS

The following is a summary of progress in accomplishing the overall goals for the Hazardous Substances Training (HST) program for the 2000-2002 grant period.

Goal 1. Offer continuing education programs (courses and conferences) to professionals involved in the hazardous substances field.

Results: Accomplished. This goal was accomplished under five major objectives. These objectives included the following: 1) Provide short-term hazardous substance post-graduate training on current issues and topics; 2) Facilitate exchange and collaboration with other safety and health professionals through course co-sponsorship with other organizations involved in hazardous substances training issues; 3) Involve the representatives of the target audience in planning and implementing programs through an advisory committee; 4) Obtain highly-qualified faculty from the private and public sector who bring both theoretical and practical knowledge to the issues presented; and 5) Develop and implement a comprehensive marketing plan.

The RMCOEH continuously evaluated its training schedule throughout the grant period for course relevance. Ideas for new topics for future course development were explored through needs assessments, post-course evaluations, regulatory requirements, and Advisory Board input. These courses either augmented or replaced existing courses depending on reflected interest and need.

Thirty-one courses, including 5 new courses, were presented to 442 registrants during the grant period.

Goal 2. Conduct research to identify training needs and training effectiveness.

Results: Accomplished. Two major objectives were identified to achieve this goal: 1) To periodically estimate the need for hazardous substances training of each state within the Center's designated region by extensive questionnaires and needs assessment surveys and 2) To annually evaluate training effectiveness through post-course questionnaires. The first objective was achieved through administration of an assessment in 2001. The second objective was achieved in 2002 through distribution of an impact evaluation to all attendees at RMCOEH courses during the previous two years.

Goal 3: Engage in service activities that enhance and promote the field of hazardous substances.

Results: Accomplished. The sole objective of this goal was to support activities that serve the needs of the target audience. This objective was met through exhibiting efforts at national, regional and local meetings as well as provisions for partial fee waivers through an initiative supported by the Utah Labor Commission. It was also met through presentations made at meetings of the target audience such as the State Office of Comprehensive Emergency Management.

BODY OF REPORT WITH CONCLUSION

As indicated in the Summary of Significant Findings section, three goals were established for the hazardous substances training (HST) program. Specific objectives were established to achieve these goals. The following details the progress in accomplishing these objectives.

Goal 1. Offer education programs (courses and conferences) to professionals involved in the hazardous substances field.

Objective 1a: To provide short-term hazardous substance post-graduate training on current issues and topics.

Results: Accomplished. At the end of the two-year grant period, 31 courses were presented to 442 participants.

1. Total number of HST courses presented during the grant period:

2000-2001	15
2001-2002	<u>16</u>
Total	31

2. Total number enrolled in HST courses during the grant period:

2000-2001	235
2001-2002	<u>207</u>
Total	442

3. Number of new HST courses presented during the grant period:

Five new courses were developed and offered during the 2000-2002 grant period. Two will be offered in the next grant period (noted with an asterisk):

Applied Industrial Hygiene for Hazardous Substances Workers
 24-Hour Emergency Response Training (Spanish)
 Hazardous Materials: Chemistry Fundamentals*
 Hazardous Materials Transportation Certification and Materials Handler's Safety*
 Universal Waste Management

Objective 1b: To facilitate exchange and collaboration with other safety and health professionals through course co-sponsorship with other organizations involved in hazardous substances training issues.

Results. Accomplished. During the grant period, the RMCOEH entered discussions with Salt Lake Community College regarding co-sponsorship of a number of hazardous substances training courses. Forming a consortium, they submitted a proposal to the Occupational Safety and Health Administration (OSHA) to become an OSHA Training Center which requires the inclusion of a number of hazardous substances courses. Notification is pending.

The Annual Utah Conference on Safety and Industrial Hygiene routinely includes courses directed to hazardous substances issues. This conference is co-sponsored with the Utah Safety Council, the local chapter of the American Society of Safety Engineers, and the local section of the American Industrial Hygiene Association.

For years, through its asbestos and lead abatement training initiatives, the RMCOEH has maintained an ongoing relationship with the regional office of the Environmental Protection Agency in Denver, Colorado as well as the Utah State Department of Environmental Quality.

Objective 1c: To involve the representatives of the target audience in planning and implementing programs through an advisory committee.

Results: Accomplished. The Hazardous Substances Advisory Committee has met annually since its inception. Committee members were specifically selected on the basis of background and involvement in hazardous substances activities. Several divisions of the Department of Environmental Quality were represented. Other committee members were from industry and the academic community. Input from these members has been, and will continue to be, used to identify the needs of the target audience and, as a result, re-evaluate the hazardous substances program schedule and course content.

Objective 1d: To obtain highly-qualified faculty from the private and public sector who bring both theoretical and practical knowledge to the issues presented.

Results: Accomplished. In addition to Center faculty who provide instructional support to the HST program, the RMCOEH has successfully drawn quality faculty from a wealth of occupational and environmental safety and health professionals in the immediate area. These are individuals who are respected and current in the field:

Corey Andrew - Industrial Hygienist Consultant (24-Hour Emergency Response Course)

Rush Bowers - Industrial Hygiene Consultant, IHI, Inc. (Asbestos & Lead Abatement training)

Russell Baker - Thermal West (Asbestos Abatement Training)

Tori Burns - Labor Commission of Utah (Respiratory Protection and Fit Testing)

Dan Crane, MS - Supervisory Physical Scientist, USDOL (Air Sampling for Toxic Substances)

Howard Deer - Utah State University (Industrial Toxicology & Applied Risk Analysis)

Merlynn Densley - IHI, Inc. (Asbestos Abatement Training)

Mark Dumas - Industrial Hygienist, Worker's Compensation Fund of Utah (Annual Utah Conference on Safety and Industrial Hygiene; OSHA 8-hour Hazardous Waste Refresher; Hazardous Materials: Chemistry Fundamentals, Hazardous Materials Transportation Certification and Hazardous Materials Handler's Safety Training, Hazardous Waste Management Simplified)

Randal Haslam - District Architect, Jordan Schools (Asbestos Abatement Training)

Kim Heimsath - Questar Pipeline, (Environmental Issues and Regulations)

Bruce Holmes - Utah Motor Carriers (Hazardous Materials Transportation)

Grantley Martelly - Consultant (Universal Waste Management)

Mark Millett - Utah Highway Patrol (Annual Utah Conference on Safety & Industrial Hygiene)

Dave Milligan - Logan City Fire Department (OSHA 40-Hour Hazwoper)

Matthew Morrison - Salt Lake City Fire Department (OSHA 40-Hour Hazwoper; 8-Hour Hazwoper Refresher)

Eldon Romney - R&R Environmental (Asbestos Abatement Training)

David Roskelley - R&R Environmental (Asbestos Abatement Training)

Ken White - IHI Environmental (Asbestos and Lead Abatement Training)

Robert T. Zeigler - Environmental Assessor, IHI, Inc. (Certified Hazardous Materials Manager Course; Hazardous Waste Management Simplified; OSHA 40-Hour Hazardous Waste Operations Course; OSHA 8-Hour Hazardous Waste Operations Refresher Course)

Objective 1e: To develop and implement a comprehensive marketing program.

Results: Accomplished. The RMCOEH maintains an in-house computerized list of recent and potential course attenders that is used for direct mailings of course announcements. The list is updated annually. In addition, association lists are purchased to augment the in-house list. The RMCOEH also maintains an in-house electronic email list which is used monthly to distribute the RMCOEH electronic newsletter as well as profile upcoming courses. Finally, the CE director continues to notify professional publications of upcoming training courses for inclusion in monthly calendars of those publications. She also advertises in trade magazines for selected courses.

Direct mail activities are supplemented by subscriptions to electronic mailing lists through the Internet. The RMCOEH also maintains an electronic email list. Upcoming courses are posted monthly to these lists. The RMCOEH electronic newsletter is posted to the RMCOEH email lists. Finally, the RMCOEH Home Page details all courses being offered. Prospective participants can download course brochures as well as register online.

GOAL 2: Conduct research to identify training needs and training effectiveness.

Objective 2a: To periodically estimate the need for hazardous substances training of each state within the Center's designated region by extensive questionnaires and needs assessment surveys.

Results: Accomplished. During the grant period, questionnaires were administered on an every-other-year basis beginning in 2001-2002.

An electronic needs assessment is also part of the RMCOEH Home Page. Some courses, such as the Hazardous Waste Management Simplified course and the OSHA 40-Hour Hazwoper course, also rely on pre- and post-course questionnaires to ensure course responsiveness and effectiveness.

Finally, in 2001, Dr. Lillquist, Industrial Hygiene Program Director, made a presentation to the State Office of Comprehensive Emergency Management at its Quarterly Meeting. At the meeting, Dr. Lillquist acquainted the

audience with the RMCOEH Hazardous Substances Training program and distributed a survey targeting the needs of that audience.

Objective 2b: To annually evaluate training effectiveness through post-course questionnaires.

Results: Accomplished. The HST Program included a needs assessment tool as part of its post-course evaluation procedure. Impact evaluations were also distributed in 2002 in order to capture needs information.

Goal 3: Engage in service activities that serve the needs of the target audience.

Objective 3a: Support activities that enhance and promote the field of hazardous substances.

Results: Accomplished. The RMCOEH offered attractive tuition fees to government (state and local) attendees. In addition, the RMCOEH participated in an initiative with the Utah Labor commission where small to medium-sized Utah businesses are awarded 50% tuition waivers to RMCOEH courses.

The RMCOEH advertised the hazardous substances training courses in relevant trade magazines to expand the notification of its course offerings and information on hazardous substance training courses are included at all RMCOEH exhibits. Electronic mailing lists were also utilized to expand the notification of upcoming courses.

Professional certification maintenance points were routinely requested and awarded for all RMCOEH-sponsored courses. These points were obtained from both the American Board of Industrial Hygiene as well as the Institute for Hazardous Materials Management.

Finally, this objective was met through exhibiting efforts at national, regional and local meetings.

CONCLUSION:

The three goals specified for the HST program were accomplished. In addition, the 8 objectives specified in support of these goals were accomplished. The HST Program experienced significant growth during the 2000-2002 grant period, both in terms of number of courses and numbers of participants. Thirty-one courses were presented to a total of 442 registrants. Five new courses were presented during this period. As with all RMCOEH CE courses, programs were structured to support the program's mission and all aspects of the program were continuously evaluated to ensure timeliness and relevance.

HAZARDOUS SUBSTANCE ACADEMIC TRAINING

ABSTRACT and OVERVIEW

Using NIOSH support, the Hazardous Substance Academic Training (HSAT) program was created at the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) at the University of Utah in February 1993. The primary program goal is to provide an academic course of study and training which produces outstanding professionals ready to contribute to protecting the health and safety of the public and individuals potentially exposed to hazardous substances through their work.

Based on NIOSH's HSAT program goals and objectives and after review and discussion, the Rocky Mountain Center's HSAT program was designed to expand on the existing American Board of Engineering Technologies (ABET)-accredited Industrial Hygiene (IH) program. The HSAT program uses the existing general public health, occupational health and safety, and IH courses and develops additional didactic, research, and hands-on experience to address some unique environmental and occupational health and safety concerns related to hazardous substances. The IH/HSAT program accepts one or two students each year, plus additional new part-time students. Graduates of the HSAT program are industrial hygienists possessing additional insights into the unique roles and responsibilities of the professional charged with anticipation, recognition, evaluation and control of occupational and environmental exposures to hazardous substances. The additional training and education these individuals receive position them to assume responsible professional roles in this uniquely specialized area of health and safety.

During the funding period, six students have been supported with HSAT funds. Five HSAT supported students have graduated. Students have submitted five manuscripts, three of which have been published. Students have also made four technical presentations at national conferences.

The Academic curriculum is designed to offer the best Master's level preparation available. It comprises didactic, field and research experiences. The interdisciplinary nature of occupational health and safety is emphasized. The program is regularly evaluated utilizing inputs from students and graduates, RMCOEH and HSAT Advisory Committee members, and other University of Utah faculty and national leaders. A significant program revision with course modifications preceded the University's conversion from quarters to semesters in fall, 2000. Ongoing minor modifications have continued as redundancies or deficiencies have been identified. These ongoing efforts ensure the currency and relevance of the HSAT Master's program.

The day to day operation of the HSAT program is accomplished by three full-time faculty members. Complementary full time faculty are in safety and ergonomics (2), occupational/environmental medicine (3), and numerous epidemiologists, biostatisticians, injury control specialists, environmental health experts, and other public health faculty. Besides full-time faculty employed by the University, numerous clinical faculty from various government, industry, and academic organizations, support the program and supplement the knowledge base. Recently, increasing the research activities of the IH/HSAT faculty has been emphasized.

SIGNIFICANT FINDINGS

Goal 1: Continue to critique and improve the HSAT program.

Result: Accomplished The HSAT program has embraced a continuous quality improvement philosophy. The program regularly seeks and acts on input and recommendations from current students, graduates, Center Advisory Committee members, other University of Utah faculty, and national leaders in IH. Identification of redundancies and deficiencies is on-going and is periodically addressed, ensuring the program's currency and relevance. The HSAT program was significantly modified just prior to 2000. This included a new principal faculty for the Hazardous Substance Management course and the University's conversion from quarters to semesters. These activities required a comprehensive evaluation of all IH/HSAT courses, course content, and course materials. New faculty brought different knowledge bases and interests which have been integrated into the program. Appendix HSAT-1 lists students enrolled during the grant period.

Goal 2: Improve HSAT research quality and research production.

Result: Accomplished. A renewed emphasis on research was initiated with two new IH/HSAT faculty. More formalized efforts, via research seminars, have been developed to increase the research success of HSAT students. Pilot Project Research Training (PPRT) grants have provided expanded research training opportunities for faculty and students. These efforts have resulted in an increased number of grant submission, funded research projects, technical presentations, and publications. Most of the HSAT research projects and publications involve students.

Goal 3: Maintain the faculty's level of regional and national service responsibilities and increase student opportunities.

Result: Accomplished Faculty and students from the HSAT program continues to be involved in numerous continuing education, outreach, community research, and service activities. As noted in the CE section, 31 courses with hazardous substances emphasis were presented during the grant period.

Goal 4: Expand interdisciplinary and collaborative efforts between HSAT and the allied health, safety, and environmental professions and organizations.

Result: Accomplished As a result of losing the Occupational Health Nursing program, a new, and formalized, effort was initiated by the core components of the Rocky Mountain Center to improve interdisciplinary opportunities. More classroom and seminar discussion on the interdisciplinary team approach has been developed. Further, the majority of research programs and contracts include collaborative investigators and participants outside the IH/HSAT Program.

BODY OF REPORT WITH CONCLUSIONS

Program Goals and Objectives:

A successful graduate training program must incorporate education, research, service and interdisciplinary interaction into its mission. Goals and objectives for the HSAT program have been established so that they complement other Center goals. The following delineates the HSAT program's goals and objectives and progress in accomplishing the objectives.

Goal 1: Continue to critique and improve the HSAT program.

Objective 1.a: Determine and respond to changing hazardous substance educational and training needs in demand in the region.

Result: Accomplished. The IH/HSAT program went through a significant restructuring just prior to 2000, including significant faculty changes, a new principal faculty for the Hazardous Substance Management course, and the University's conversion from quarters to semesters. These activities required a comprehensive evaluation of courses, course content, and course materials. The effort resulted in a strategically designed course of study with appropriate overlap and integration of curriculum. The program regularly seeks and acts on input and recommendations from current students, graduates, Center Advisory Committee members, other University of Utah faculty, and national leaders. Identification of redundancies and deficiencies is on-going and are addressed ensuring the Program's currency and relevance.

Objective 1.b: Continue to improve the HSAT equipment and instrumentation to meet demands for training and site analysis.

Result: Accomplished. A computer replacement program is in place, replacing one new computer annually. The program has three faculty and two student computers, thereby having a five-year obsolescence cycle. The University of Utah's library system has maintained its holding of occupational health and safety journals including electronic subscriptions. Mr. DeRosso has developed a five-year IH/HSAT equipment purchasing plan. The plan is based on existing equipment, future needs, and a prioritization list. The laboratory equipment budget is now approximately \$1500/year not including equipment from research grants and contracts. Through increased research funding, the amount and quality of research instrumentation has also increased.

Objective 1.c: Recruit qualified students into the HSAT program

Result: Partially Accomplished The HSAT Program has had three very good recruiting years: both quantity and quality. The entering class of 2001 included two out-of-state students including one military officer. However, a recruitment program involving standing dates for visits to targeted undergraduate programs has only been partially successful.

Objective 1.d: Establish a process for feedback and incorporation of recommendations from alumni for program enhancement.

Result: Partially Accomplished To date, feedback from alumni who followed the HSAT track remains primarily informal. Although the feedback is positive and is valuable, better documentation of these communications and a formal mechanism acknowledging comments and any action on comments is in development. It is planned that the 2003 survey of RMCOEH graduates will provide for the necessary, more formal, feedback.

Goal 2: Improve HSAT research quality and research production.

Objective 2.a.: Develop a research strategy for HSAT which capitalizes on the strengths of a multi-disciplinary faculty and regional needs.

Result: Accomplished. In order to develop a research engine, faculty must subscribe to a research agenda. Research was emphasized in the hiring of new faculty. Drs. Lillquist, Stephenson, and Mr. DeRosso have been successful at obtaining funding for numerous research grants, significantly increasing the total number and dollar support. Faculty actively participated in development of the RMCOEH Research Plan, discussed in the Administration section, and have used the plan in expanding research efforts.

Objective 2.b: Have the IH/HSAT program produce three extramural research grant proposals per year.

Result: Accomplished. IH/HSAT faculty submitted 20 research proposals during the grant period.

Objective 2.c: Improve research mentoring and the development of junior faculty and graduate students research skills.

Result: Accomplished The research seminar has been very successful in better preparing students for their research. The teaching load has been more evenly distributed across the three full-time faculty positions which allows for some additional time for junior faculty to develop their research skills. All faculty regularly attend workshops and seminars on grants writing.

Objective 2.d: Create a student operations and research manual.

Result: Accomplished. The manual is in its second year of use. The manual provides information on research potentials, funding sources, and other information.

Objective 2.e: Have at least 66 percent of HSAT supported student research projects submitted to a peer-reviewed journal.

Results: Accomplished. Students have submitted five manuscripts, three of which have been published.

Objective 2.f: Submit a minimum of two manuscripts for publication in a peer-reviewed journal per year per full-time doctoral faculty member.

Result: Accomplished. Faculty have submitted three book chapters, eight articles, and one book that have been published.

Goal 3: Maintain the faculty's level of regional and national service responsibilities and increase student opportunities.

Objective 3.a: Have faculty join one additional national professional committee.

Result: Partially Accomplished. Dr. Stephenson has joined the AIHA-Academic Special Interest Group and attends the AIHA - International Committee meetings. Mr. DeRosso has focused on developing state and regional committee activities.

Objective 3.b: Increase student participation in local and national professional organizations and conferences.

Results: Accomplished. The IH/HSAT program pays for student membership to the AIHA-UT Section (non-NIOSH funds). Attendance at the quarterly meetings is strongly encouraged. Travel and per diem will be paid for any student who has had a paper accepted for presentation at a professional meeting. Student attendance at the Joint Utah Conference

on Occupational Safety and Health and the National AIHAC&E is supported and is consistently high.

Objective 3.c: Continue to present the highest quality, timely and informative CE courses in IH/HSAT

Results: Accomplished. Continued strategic planning is on-going with the Center's CE program. Contract courses and shorter (seminar format) courses are being discussed for the future. Recently, both an environmental mold course (risk assessment and remediation) and an exposure assessment course was developed and conducted. Thirty-one courses with Hazardous Substances emphasis were presented during the grant period. (See CE Section.)

Goal 4: Expand interdisciplinary and collaborative efforts between IH and the allied health, safety, and environmental professions and organizations.

Objective 4.a: Increase partnerships with regional universities, state and federal governments, private organizations, and other key facilities in the region.

Results: Accomplished. Research partnerships have been entered into with representative organizations from those listed above. Examples include Montana Tech University, Colorado State University, Utah Department of Environmental Quality, Utah Department of Health, Utah Environmental Health Association, Federal and Utah OSHA, EPA, Idaho National Environmental and Engineering Laboratory, and Los Alamos

CONCLUSION:

There have been significant changes to the IH/HSAT Program. A semester conversion, the recruitment of two new faculty, and an increased emphasis in research activities have changed the orientation of the program. Through the changes, and because of them, the program succeeded in accomplishing all four identified goals. The result is that students continue to receive excellent preparation for the professional practice of industrial hygiene, and additionally, hazardous substance applications, through the multi-disciplinary and academically rigorous setting afforded by an Education and Research Center.

HAZARDOUS SUBSTANCE
ACADEMIC TRAINING APPENDICES

Appendix HSAT-1
 Hazardous Substance Academic Training Program Students and Graduates
 7/1/00 - 6/30/02

Names omitted due to University Policy. Initials used instead of names	Date Entered Program	Date Program Completed	Degree Awarded	Current Employment Status (Job title/employer)	Current Business Address
J.C.	Fall 97	Spring 01	MSPH	Utah Labor Comm 160 E 300 S 3 rd Fl	SLC UT 84114
C.S.	Fall 97	Fall 00	MSPH	US Navy	Portsmouth VA 23709
A.R.	Fall 99	Spring 01	MSPH	Safety Office Naval Aviation Depot	Cherry Point NC 28533-0021
S.T.	Fall 99	Spring 01	MSPH	Colorado State Univ	PhD Environmental Health
C.A.	Fall 00	Spring 02	MSPH		
C.S.	Fall 01			Student	

* Please specify by asterisk those program graduates that did not receive NIOSH financial support.



Memorandum

Date November 5, 2002

From Principal Engineer, OEP, NIOSH

Subject Final Progress Report for entry into NIOSHTIC2/NTIS for
NIOSH Training Grant No. T42 CCT 810426

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

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

Title: Rocky Mountain Center for Occupational & Environmental Health

Center Director: Royce Moser, Jr., M.D., MPH
Department of Family & Preventive Medicine
University of Utah
Salt Lake City, UT 84112

Grant No.: T42 CCT 810426

Project Period: 7/1/2000 - 6/30/2002

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

Thanks for your assistance.


John T. Talty, P.E., DEE

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

Enclosure

fpr.uut