

Final Progress Report

NIOSH Training Grant No. 5 T03 OH008437
Occupational Safety and Health Program Improvement

July 1, 2010 - June 30, 2016

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LIST OF ABBREVIATIONS

ASAC/ABET	Applied Science Accreditation Commission of ABET
AIHA	American Industrial Hygiene Association
ASSE	American Society of Safety Engineers
A.S.	Associate of Science
ASHM	Associate Safety and Health Manager
B.S.	Bachelor of Science
BCSP	Board of Certified Safety Professionals
CSHM	Certified Safety and Health Manager
CSP	Certified Safety Professional
GSP	Graduate Safety Practitioner
IET	Industrial Engineering and Technology
ISHM	Institute for Safety and Health Management
M.S.	Master of Science
MSU	Murray State University
NIOSH	National Institute for Occupational Safety and Health
OSH	Occupational Safety and Health
QAP	Qualified Academic Program
RAC/ABET	Related Accreditation Commission of ABET

ABSTRACT

The national demand for diversified education and training of safety and health professionals led to the establishment of the Department of Occupational Safety and Health (OSH) at Murray State University (MSU) in 1978. The Department of Occupational Safety and Health at Murray State provides a variety of curriculum options which includes a bachelor of science (B.S.) in the area of occupational safety and health with safety and environmental tracks; master of science (M.S.) in occupational safety and health with concentrations in safety management, industrial hygiene, and environmental, including an online program with a concentration in safety management; and a technical minor in occupational safety and health. Each degree provides a comprehensive broad-based educational background designed to prepare individuals for entry-level and advanced work in the field.

The undergraduate and graduate programs in occupational safety and health are accredited by the Applied Science Accreditation Commission of ABET (ASAC/ABET). Both programs were originally accredited by the American Society of Safety Engineers (ASSE) in 1988. The safety program at Murray State is currently the only occupational safety and health program in the United States with both its B.S. and M.S. degrees accredited by ASAC/ABET. Accreditation, along with curriculum changes and support from the National Institute for Occupational Safety and Health (NIOSH), serve to increase the visibility of the occupational safety and health programs at Murray State.

The grant support was used to strengthen the preparation of the undergraduate and graduate level students. This was accomplished by providing learning situations designed to help students become more effective entry-level and advanced professionals. The primary focus was:

1. Increased visitation to intern jobsites by the internship supervisors to observe and improve employer-intern-university relationships.
2. Development and enhancement of interdisciplinary/multidisciplinary courses, concentrations and minors with the following programs: criminal justice, business, and environmental/civil engineering technology.
3. On-going faculty professional development to keep abreast of changes in the occupational safety and health field.
4. Development of seminars and Occupational Safety and Health Training Center (OSHTC) courses and certifications designed to address current occupational safety and health issues.
5. Support for students in the form of travel and tuition/fees.
6. Improvement and upgrade of laboratory and computer equipment within the department.

Major accomplishments in this reporting period included curriculum and program enhancement, increased professional development of faculty, improvement in recruitment and retention, increased numbers and placement of interns and graduates, expansion of seminars and continuing education output, and improvement and upgrade

of the laboratory equipment within the department. The occupational safety and health program at Murray State continues to be a growing, vibrant program. Improvements, including strengthening the curriculum, internship program, faculty, and student development and recruitment and retention of underrepresented groups, are aimed at fortifying a solid program. The requested NIOSH support helped improve and enhance the quality of the programs.

HIGHLIGHTS/SIGNIFICANT RESULTS

Over the past six years (July 1, 2010 - June 30, 2016) the Department of Occupational Safety and Health generated a great deal of effort in training, graduation, and placement (graduate/internship and continuing education) activities. The following is a summary of these activities.

- The department graduated 509 students. This figure represents a total of 328 undergraduate students receiving a B.S. degree and 181 graduate students receiving a M.S. degree (*See Table 2*). The department has also seen an increase in enrollment over the past six years (*See Table 3*).
- The department placed 778 paid interns in 38 states and various countries, including China, Nigeria, Saudi Arabia, and United Arab Emirates (*See Table 1*).
- The full-time placement of MSU OSH students is very high. Each semester, at least 30 to 40 potential employers travel to the department to host an information session for potential hires and/or hold interviews on site. Industries where graduates are employed range from insurance, oil/petroleum, construction, food processing, warehousing and distribution to manufacturing.
- The Occupational Safety and Health Training Center offered 186 training programs reaching 3,345 trainees (*See Table 4*).
- Thirty-three students received NIOSH trainee support in the form of tuition/fees and paid travel expenses (*See Table 5*). Additional students participated in travel to various industries, seminars, leadership conferences and professional meetings, including regional and local meetings, and conferences for student academic and professional development. Each year the occupational safety and health students attend the Kentucky Governor's Safety and Health Conference, the American Society of Safety Engineers (ASSE) Professional Development Conference (PDC), the American Industrial Hygiene Association (AIHA) Conference, and the Tennessee Safety and Health Conference. Attendance at these conferences provides an avenue to discuss internship and placement opportunities, provides opportunities to network with those in the field, and increases their marketability.
- NIOSH grant support provided travel assistance to conferences and trainings for faculty academic and professional development. Faculty members attended and/or presented at the Tennessee Safety and Health Conference, Kentucky Governor's Safety and Health Conference, ASSE Conference, AIHA Conference, Human Factors and Ergonomics Society Conference, Applied Ergonomics Conference, Society of Risk Analysis Annual Conference, Safe Communities America Networking Conference, Indiana Safety Conference, the NIOSH Pilot Research Project Symposium, and regional and local ASSE and AIHA meetings. In addition, faculty were sent to receive and/or maintain 30-hour OSHA training to provide certifications opportunities to MSU OSH students. Attendance at these conferences also provided an avenue to promote the occupational safety and health program at Murray State

and develop relationships with and discuss internship and placement opportunities with prospective employers of students.

- The department underwent a program review resulting in minor revisions of the undergraduate and graduate curriculum, as well as the implementation of an online graduate program. The following is a list of changes in the curriculum as a direct or indirect result of the training program.
 - In 2014, the department began offering an online M.S. degree in OSH with a concentration in safety management. The program is designed for those already working in the field and is especially applicable for those individuals who have a B.S. degree in OSH or a closely related degree. The online degree program is equivalent to the on-campus program, and is accredited through ASAC/ABET.
 - A formal application process for admission into the OSH B.S. program was instituted in fall 2014 and was refined in 2015. In addition, changes in graduation requirements focused on improving student quality by increasing the cumulative GPA for graduation, requiring that all OSH courses were passed with a C or better letter grade, and limiting the number of times a course could be repeated to twice.
 - The undergraduate and graduate curriculums underwent a thorough evaluation by the department curriculum and accreditation committees. Minor modifications, enhancements to select courses, and additions/deletions to the undergraduate technical elective list and graduate concentrations took place.
 - The OSH 450, Practical Application, lab course was enhanced to allow OSH students to gain hands-on experience with increased varieties of equipment utilized in the field.
 - In 2014, OSH 330/630, Global Issues in OSH, was added as electives to both the B.S. and M.S. curricula as a new study abroad course providing students the opportunity to study OSH on a global scale and adding to the experiential learning aspect of the OSH B.S. and M.S. degree program.
 - The department continued its outcomes-competency based assessment process for its program outcomes with documented results. The following assessments were utilized: alumni surveys, graduate exit surveys, intern surveys, course surveys, employer surveys, advisory council surveys, and placement data of graduates. These assessments are utilized in an ongoing process of improving student learning through enhancements to the program.

OUTCOMES/RELEVANCE/IMPACT

- **The department graduated 509 students. This figure represents a total of 328 undergraduate students receiving a B.S. degree and 181 graduate students receiving a M.S. degree (See Table 2). The department has also seen a continued increase in enrollment throughout the grant period (See Table 3).** These graduates and future graduates will help meet the increasing demand for future safety and health professionals throughout the country as well as globally.
- **The department placed 778 interns in 38 states and various countries, including China, Nigeria, Saudi Arabia, and United Arab Emirates over the past six years (See Table 1). Interns were visited by department faculty throughout the United States.** The purpose of the travel was to visit the student/intern, supervisor, and other related personnel to discuss the progress and any concerns associated with the internship. It enabled internship supervisors to strengthen existing commitment to the occupational safety and health program at Murray State and developed new industry contacts in the areas where interns were located. The real-world experiences provided by the internships are critical to the overall quality of students in the occupational safety and health program at Murray State.
- **The department offered 186 training programs reaching 3,345 trainees (See Table 4).** The department offered a number of training courses and seminars to students and industry which were of interest to a wide range of individuals working in the occupational safety and health profession. This included a variety of certification courses that help enhance the marketability and depth of hands-on training of our students.
- **Thirty-three students received NIOSH trainee support in the form of tuition/fees and paid travel expenses (See Table 5). The trainees also received a waiver of out-of-state fees if applicable. Additional students participated in travel to various industries, seminars, leadership conferences and professional meetings and conferences.** This grant support provided students with academic and professional development, provided opportunities to network with those in the field, and increased their marketability.
- **The department continued to develop its state-of-the-art practical applications laboratory (Confined Space, Scaffolding, Lockout/Tagout, Material Handling, Fall Protection, Ergonomics, Industrial Hygiene, Environmental Monitoring and PPE), EMT laboratory, and OSH Training Center which provides students with a variety of needed hands-on experience necessary for today's competitive work environment.** Laboratory equipment was purchased to enhance the learning environment and to give students the opportunity for additional hands-on experience with current work-related equipment and technology. Examples of purchased equipment include EMT Equipment (Dyna Med Hare Traction Splint, Pulse Oximeter, and Airway Management Trainer); OSH Training Center equipment/supplies (Placard Kit, Workplace Drum Incident Kit, Poly Drum Spill Kit,

and Projector for the training room); Ergonomic equipment (software and dynonometer); and iPads to utilize in various labs and classes.

- **In 2014, the department began offering an online M.S. degree in OSH with a concentration in safety management.** The program is designed for those already working in the field and is especially applicable for those individuals who have a B.S. degree in OSH or a closely related degree. The online degree program is equivalent to the on-campus program and is accredited through ASAC/ABET.
- **In 2014, OSH 330/630, Global Issues in OSH, was added as electives to both the B.S. and M.S. curricula as a new study abroad course providing students the opportunity to study OSH on a global scale and adding to the experiential learning aspect of the OSH B.S. and M.S. degree program.** Since the adoption of OSH 330/630, study abroad tours have been conducted to England, France, Argentina, and Ireland.

TECHNICAL REPORT

BACKGROUND

Establishment

The national demand for diversified education and training for safety and health professionals led to the first courses in workplace safety being offered at Murray State University in 1972. These courses were Industrial Safety and Construction Safety and were offered through the Department of Engineering and Industrial Technology in the College of Industry and Technology. Demand for these courses and for additional course offerings in workplace safety and health resulted in a proposal to the university to initiate, seek state approval of, and offer formal degree programs in occupational safety and health at Murray State University. This was accomplished in 1976 without any outside assistance in grants or funds.

More specifically, after considerable research, formal degree programs were drawn up to offer an Associate of Science (A.S.), Bachelor of Science (B.S.), and Master of Science (M.S.) degrees in Occupational Safety and Health in 1976. In 1977, students began pursuing degrees in Occupational Safety and Health. In 1978, the decision was made to offer these degree programs under a separate department entitled the Department of Safety Engineering and Health. In 1989, the name of the department was changed to the Department of Occupational Safety and Health. In succeeding years, the Associate of Science degree was dropped as a program offering due to lack of demand.

Accreditation

The B.S. and M.S. programs in occupational safety and health at Murray State were first accredited by the American Society of Safety Engineers (ASSE) in 1988. The programs were accredited again in 1993 by ASSE, and by the Related Accreditation Commission of ABET (RAC/ABET) in 1998, later changed to Applied Science Accreditation Commission of ABET (ASAC/ABET) in 2002. The B.S. and M.S. programs in occupational safety and health were again accredited in 2005 and 2010 by ASAC/ABET. The safety program at Murray State is currently the only program in the United States with both its B.S. and M.S. degrees accredited in occupational safety and health by ASAC/ABET.

Facilities

In 1991, the Department of Occupational Safety and Health moved to the Martha Layne Collins Center for Industry and Technology, where it is currently located today. Facilities include specialized labs for study in Industrial Hygiene, Hazardous Materials, Ergonomics, Emergency Medical Training, Computer, Fire Safety, Physical Hazards, and the Practical Applications Laboratory, which also includes the J.J. Keller Safety and Regulatory Compliance Study Lab. These labs serve as a training ground for future occupational safety and health professionals.

The Martha Layne Collins Center for Industry and Technology also houses a 250 seat auditorium. The department utilizes this facility for meetings, workshops, and major seminars. The department also has appropriate space in which to house the

Occupational Safety and Health Training Center which was established in 1989. The OSH Training Center provides (non-degree) training and course offerings for selected industries, personnel, and agencies within the region.

Academic Programs

The Department of Occupational Safety and Health at Murray State provides a variety of curriculum options which includes a bachelor of science (B.S.) in the area of occupational safety and health with safety and environmental tracks; master of science (M.S.) in occupational safety and health with concentrations in safety management, industrial hygiene, and environmental, including an online program with a concentration in safety management; and a technical minor at the undergraduate level in occupational safety and health.

The academic programs in occupational safety and health are designed to provide a comprehensive, broad-based educational background designed to prepare academically sound graduates with practical experience for positions in the occupational safety, health, and environmental profession. This objective is met through the design of the curricula to provide a general education component intended to enhance students' abilities in communications, reasoning, and cultural awareness; a basic instruction component in scientific and engineering principles; applied course work in the management and technical areas of occupational safety and health; and an internship position to expose students to experience in their field.

Internship Program

In 1980, the occupational safety and health internship program at Murray State University was initiated and developed by Dr. Marvin Mills. From 1987-2014, Dr. David Kraemer served as the internship coordinator, from 2014-2015, Dr. Gary Morris served, and from 2015-present Dr. Tracey Wortham serves as the coordinator of the department's internship (experiential education) program.

Faculty

There are currently eleven full-time faculty in the Department of Occupational Safety and Health at Murray State University. Four are tenured, four are in tenured track positions, and three are in non-tenure track lecturer positions. Each faculty member has a primary commitment to the program and shared responsibility for establishing and monitoring program educational objectives, student outcomes, course content, and pursuing continuous program improvements.

The department also utilizes three adjunct faculty on a regular basis who usually teach one course at the Murray State campus each semester in their area of specialty. Additional faculty are utilized regularly to teach a course at an off campus site. Faculty from the Institute of Engineering serve as supporting faculty for the environmental track at the undergraduate level.

The program is well-staffed, with a diversity of expertise which encompasses all aspects of safety and health including general safety, Industrial Hygiene, Environmental Safety

and Health, Toxicology, Construction, and Ergonomics with each faculty member having advanced degrees and/or practical experience in their area of specialization. The expertise, experience, certifications, and attitude of the OSH faculty have been identified as a source of the program's strength. For a table illustrating the core and support faculty, as well as their specific areas of competencies see Table 6.

Student Organizations

There are currently three student organizations within the Occupational Safety and Health department. They are as follows.

American Industrial Hygiene Associate (AIHA)

The Murray State University AIHA Student Chapter was chartered in 1992, and the current student chapter advisor is Dr. Bassam Atieh. This student chapter was nationally named Student Chapter of the Year in 1998, 2002, 2004, 2006, 2008, and 2010. The AIHA student organization focuses on issues related to industrial hygiene. Its main function is to promote academic excellence and professionalism among its members. The organization invites professionals to speak at meetings not only about safety-related topics but also topics (such as retirement planning and financial management) to better prepare students in the personal lives as they begin their safety careers.

American Society of Safety Engineers (ASSE)

The Murray State University ASSE Student Section was chartered in 1979, the current student section advisor is Dr. Gary Morris. This student section was nationally named Outstanding Student Section of the Year in 1985, 1992, 2000, 2002, 2004, 2005, 2007, 2008, and 2015. Activities include performing community service. The organization also invites safety professionals to speak at meetings.

Rho Sigma Kappa

Chartered in 1998, Rho Sigma Kappa is an Honors Society in Safety and Health-Beta Chapter. The faculty advisor is Dr. Tracey Wortham. The purpose of this society is to honor and recognize those students of safety who distinguish themselves through academic achievement and exemplary character, foster scholarship and promote student leadership, and contribute to the advancement of professionalism in safety.

Certifications

In the spring of 2006, the first group of Graduate Safety Practitioners (GSP) was awarded certificates by a representative from the Board of Directors of the Board of Certified Safety Professionals (BCSP) at Murray State University. The GSP designation recognizes students graduating from Qualified Academic Programs (QAP) who develop suitable knowledge and skills for entry into, or advancement in, professional safety practice. The GSP is a step in the path of receiving the Certified Safety Professional (CSP) designation and is awarded to qualified individuals to mark their completion of an independently accredited academic program.

The Board of Directors of the Institute for Safety and Health Management (ISHM) has also recognized the Department of Occupational Safety and Health's B.S. and M.S. degrees. Students graduating with a B.S. or M.S. in occupational safety and health at Murray State may immediately apply for the Associate Safety and Health Manager (ASHM) certification and with two years of experience in the safety and health management field apply for and take the Certified Safety and Health Manager (CSHM) exam.

NIOSH Grant Administration

Administratively, Dr. Gary Morris, Chair of the OSH department (2014-2015) and faculty member (2015-2016), served as the project director from July 2014 to June 2016 and intern/co-op coordinator from 2014-2015 after the retirement of Dr. David Kraemer in 2014. Prior to Dr. Morris, Dr. Kraemer served as Chair, project director, and intern/co-op coordinator which he fulfilled since 1993. Dr. Kraemer joined the staff in 1986 and served as the department internship/co-op placement coordinator from 1987-2014. He was very active professionally at the state and national level and serves or has served on a variety of boards, councils, and committees.

The project director responsibilities included overseeing the project grant and all its activities. The project director brought in outside specialists to deliver presentations in occupational safety and health areas that would otherwise be unavailable to Murray State students. The project director also served as the director of the OSH Training Center.

As the intern/co-op coordinator, the project director's responsibilities included the selection, placement, and supervision of student interns. The intern/co-op coordinator also ensured that appropriate interns were visited and that good working relationships were maintained with employers of interns. The coordinator represented the department at conferences and expositions to help maintain ongoing contacts with employers of potential interns and graduating students.

The project director continued to utilize the department's Advisory Council for guidance in maintaining a high quality, relevant program. Many significant contributions to curriculum improvement and program development were generated over the years by the department's advisory council which meets at least once a year. The council consists of individuals representing a wide variety of expertise, backgrounds, and organizations

Dr. David L. Fender, Professor, in the Department of Occupational Safety and Health, served as an intern/co-op supervisor. Dr. Fender completed his doctorate degree at Vanderbilt University in May 2001 and holds a M.S. degree in Safety from the University of Southern California. Dr. Fender is a CSP along with many other certifications and professional activities. Dr. Fender joined the staff in the fall of 1995 and taught courses in systems safety, safety management, and management and enforcement of accident prevention. Dr. Fender retired as of June 2016.

The departmental internship/co-op supervisor visited working interns while on the job-site. This involved extensive travel throughout the United States. The purpose of the travel was to visit the student, supervisor, and other related personnel to discuss the progress and any concerns associated with the internship. It enabled the internship supervisors to strengthen existing industrial commitment to the occupational safety and health program at Murray State and developed new industry contacts in the areas where interns were located.

SPECIFIC OBJECTIVES

The purpose of the grant was to strengthen the preparation of the undergraduate and graduate level students in occupational safety and health at Murray State University. This was done by providing learning situations designed to help students become more effective entry-level and advanced professionals. The primary focus was:

1. Increased visitation to intern jobsites by the internship supervisors to observe and improve employer-intern-university relationship.
2. Development and enhancement of interdisciplinary/multidisciplinary courses, concentrations and minors with the following programs: criminal justice, business, and environmental/civil engineering technology.
3. On-going faculty professional development to keep abreast of changes in the occupational safety and health field.
4. Development of seminars and Occupational Safety and Health Training Center (OSHTC) courses and certifications designed to address current occupational safety and health issues.
5. Support for undergraduate and graduate students in the form of travel and tuition/fees.
6. Improvement and upgrade of laboratory and computer equipment within the department.

RESULTS AND DISCUSSION

The progress and success during the grant period has continued to strengthen the training of undergraduate and graduate students in occupational safety and health at Murray State. This was accomplished by providing learning situations designed to help students become more effective entry-level and advanced professionals.

The following are essential program enhancements accomplished with grant assistance:

1. Increased visitation to intern jobsites by the internship supervisors to observe and improve employer-intern-university relationship (**travel funds and personnel funds**).

The department placed 778 interns in 38 states and various countries, including China, Nigeria, Saudi Arabia, and United Arab Emirates over the past six years

(See Table 1). During the grant period, extensive travel throughout the United States was conducted. The purpose of the travel was to visit the student/intern, supervisor, and other related personnel to discuss the progress and problems associated with the internship. It enabled internship supervisors to strengthen existing commitment to the occupational safety and health program at Murray State and developed new industry contacts in the areas where interns were located. Typically, first year employers of interns receive priority for visits from the coordinator, but some veteran participants were visited as well.

2. Development and enhancement of interdisciplinary/multidisciplinary courses, concentrations and minors with the following programs: criminal justice, business, and environmental/civil engineering technology **(personnel and travel funds)**.

Coursework in criminal justice, business, organizational communications and environmental/ civil engineering technology engineering technology has been added as technical electives for the B.S. in occupational safety and health degree.

3. On-going faculty and student academic and professional development to keep abreast of changes in the occupational safety and health field **(faculty and trainee travel funds)**.

Thirty-three students received NIOSH trainee support in the form of tuition/fees and paid travel expenses (See Table 5). Additional students participated in travel to various industries, seminars, leadership conferences and professional meetings and conferences.

NIOSH grant support provided travel funds to conferences and trainings for student and faculty academic and professional development. Each year the occupational safety and health students and faculty attend and/or present at the Tennessee Safety and Health Conference, Kentucky Governor's Safety and Health Conference, ASSE Conference, AIHA Conference, Human Factors and Ergonomics Society Conference, Applied Ergonomics Conference, Society of Risk Analysis Annual Conference, Safe Communities America Networking Conference, Indiana Safety Conference, the NIOSH Pilot Research Project Symposium, and regional and local ASSE and AIHA meetings. In addition, faculty were sent to receive and/or maintain 30-hour OSHA training to provide certifications opportunities to MSU OSH students.

Attendance at these conferences provide students an avenue to discuss internship and placement opportunities, provided opportunities to network with those in the field, and increase their marketability. Attendance at these conferences also provided faculty an avenue to promote the occupational safety and health program at Murray State and develop relationships with and discuss internship and placement opportunities with prospective employers of students.

4. Development of seminars and expansion of the Occupational Safety and Health Training Center courses designed to address current occupational safety and health issues **(equipment funds)**.

During the grant period the Occupational Safety and Health Training Center offered 186 training programs reaching 3,345 trainees (*See Table 4*).

5. Support for graduate students in the form of travel and tuition/fees **(travel funds and tuition/fees funds)**.

Student tuition and fees assistance were provided for select master's students. The trainees also received a waiver of out-of-state fees if applicable (*See Table 5*). As stated above, 33 students were NIOSH supported trainees who received trainee support in the form of tuition/fees and paid travel expenses. Additional students participated in travel to various industries, seminars, leadership conferences and professional meetings and conferences. This grant support provided students with academic and professional development, provided opportunities to network with those in the field, and increased their marketability.

6. Improvement and upgrade of the laboratory and computer equipment within the Occupational Safety and Health department **(equipment funds)**.

The department continued to develop its state-of-the-art practical applications laboratory (Confined Space, Scaffolding, Lockout/Tagout, Material Handling, Fall Protection, Ergonomics, Industrial Hygiene, Environmental Monitoring and PPE), EMT laboratory and OSH Training Center which provide students with a variety of needed hands-on experience necessary for today's competitive work environment. Laboratory equipment was purchased to enhance the learning environment and to give students the opportunity for additional hands-on experience with current work-related equipment and technology. Examples of purchased equipment include EMT Equipment (Dyna Med Hare Traction Splint, Pulse Oximeter, and Airway Management Trainer); OSH Training Center equipment/supplies (Placard Kit, Workplace Drum Incident Kit, Poly Drum Spill Kit, and Projector for the training room); Ergonomic equipment (software and dynonometer); and iPads to utilize in various labs and classes.

7. Development and enhancement of the occupational safety and health programs, both the B.S. and M.S. programs.

The department developed an online M.S. degree program in occupational safety and health with a concentration in safety management. The first cohort began in fall 2014 and thirteen students graduated from the first cohort in May 2016. The program is designed for those already working in the field and is especially applicable for those individuals who have a B.S. degree in occupational safety and health or a closely related degree. The program is accredited by the Applied Science Accreditation Commission of ABET (ASAC/ABET).

In 2014, OSH 330/630, Global Issues in OSH, was added as technical electives to both the B.S. and M.S. curricula as a new study abroad course providing students the opportunity to study OSH on a global scale adding to the experiential learning aspect of the OSH B.S. and M.S. degree program.

CONCLUSIONS

As indicated above, the occupational safety and health program at Murray State continues to be a growing, vibrant program. Improvements, including strengthening the curriculum, internship program, faculty, and student development and recruitment, and retention of underrepresented groups, are aimed at fortifying a solid program. The requested NIOSH support helped improve and enhance the quality of both the B.S. and M.S. program.

PUBLICATIONS

There have been no publications resulting from the grant.

Appendix

**Table 1. Internship/Co-op Placement
Past Six Academic Years**

Fall 2010.....	5 Interns
Spring 2011.....	6 Interns
Summer 2011.....	79 Interns
Total	90 Interns
Fall 2011.....	8 Interns
Spring 2012.....	6 Interns
Summer 2012.....	94 Interns
Total	108 Interns
Fall 2012.....	9 Interns
Spring 2013.....	10 Interns
Summer 2013.....	113 Interns
Total	132 Interns
Fall 2013.....	8 Interns
Spring 2014.....	6 Interns
Summer 2014.....	125 Interns
Total	139 Interns
Fall 2014.....	9 Interns
Spring 2015.....	6 Interns
Summer 2015.....	150 Interns
Total	165 Interns
Fall 2015.....	3 Interns
Spring 2016.....	2 Interns
Summer 2016.....	139 Interns
Total	144 Interns
Grand Total: 778	

**Table 2. Graduation Trends
Past Six Academic Years**

Academic Year	Program Graduates		Total Graduates
	B.S.	M.S.	
2010-2011	41	27	68
2011-2012	45	24	69
2012-2013	44	23	67
2013-2014	48	35	83
2014-2015	57	30	87
2015-2016	93	42	135
Total	328	181	509

**Table 3. Enrollment Trends
Past Six Academic Years**

Academic Year	B.S. Total	M.S. Total
Fall 2010	222	43
Fall 2011	239	42
Fall 2012	315	51
Fall 2013	372	50
Fall 2014	409	64
Fall 2015	423	86

**Table 4. Training – Continuing Education Output
Past Six Academic Years**

Academic Year	Number of Courses	Total Trainees
2010-2011	26	539
2011-2012	33	656
2012-2013	41	658
2013-2014	34	444
2014-2015	32	601
2015-2016	20	447
Total	186	3345

**Table 5. Trainees Supported – Tuition/Fees and Travel
Past Six Academic Years**

Name of Trainee	Degree	Initial or Current Employment/ Job Title/Other Placement
Year 1: 2010-2011		
Kiah Clayton	MS	C.N.A. Insurance/Risk Control Trainee
Ashley Davis	MS	Leprino Foods/Sr. Safety Specialist
Jacob Hagan	MS	Chevron/D&C HES Specialist
Nikki Hjerpe	MS	Bridgestone Firestone/Safety Coordinator
Stephanie Miller	MS	URS/ESH Specialist
Cameron Shipp	MS	Chevron/HES Specialist
Joe Tarry	MS	Sherwin-Williams/Corporate Safety Trainee
Donielle Wethington	MS	Unilever/SHE Supervisor
Scott Zigrye	MS	Georgia-Pacific/Safety Representative
Year 2: 2011-2012		
Mollie Baxley	MS	Chevron/HES Specialist
Oluwatomisin Elelu	MS	Chevron/HES Specialist
Triana Fleming	MS	Chevron/OE HES Specialist
Cameron Shipp	MS	Chevron/HES Specialist
Stephanie Miller	MS	URS/ESH Specialist
Anna Newmaster	MS	Unknown
James Rhodes	MS	Google/Environmental and Safety Technician
James Simpson	MS	Northrop Grumman/System Safety Engineer
Brett Welter	MS	Chevron/HES Specialist
Donielle Wethington	MS	Unilever/SHE Supervisor
Year 3: 2012-2013		
Mollie Baxley	MS	Chevron/HES Specialist
Ashley Birdwell	MS	Western Kentucky University/EHS Specialist
James Campbell	MS	Chevron/HES Specialist
Triana Fleming	MS	Chevron/OE HES Specialist
Patrick Harris	MS	Amazon/Safety Specialist
Emerson Jarvis	MS	Freescall/EHS
James Rhodes	MS	Google/Environmental and Safety Technician
James Simpson	MS	Northrop Grumman/System Safety Engineer
Meghan Cavins	MS	Anadarko/HSE Representative
Brandon Hoehn	MS	Chevron/HES Specialist
Year 4: 2013-2014		
Amber Higgins	MS	BHP Billiton Petroleum /HSEC Specialist
Amber Miller	MS	Baker Hughes/HSE Specialist
Ashley Birdwell	MS	Western Kentucky University/EHS Specialist
Brandon Hoehn	MS	Chevron/HES Specialist
Desmond Etheridge	MS	Liberty Mutual/Risk Consultant

Emerson Jarvis	MS	Freescale/EHS
James Campbell	MS	Chevron/HES Specialist
Jeremy Turner	MS	Northrop Grumman/System Safety Engineer
Meghan Cavins	MS	Anadarko/HSE Representative
Amanda Dean	MS	Baker Hughes/HSE Specialist
Year 5: 2014-2015		
Rachel Ragovin	MS	Summit/Loss Control
Meghan Cavins	MS	Anadarko/HSE Representative
Logan Chavis	MS	Westlake Chemical/Environmental, Safety and Health Coordinator
Joshua Reed	MS	Consolidated Grain and Barge/Regional Safety and Health Associate
Jillian Morgan	MS	Currently Searching
Desmond Etheridge	MS	Liberty Mutual/Risk Consultant
Amber Miller	MS	Baker Hughes/HSE Specialist
Amber Higgins	MS	BHP Billiton Petroleum /HSEC Specialist
Amanda Dean	MS	Baker Hughes/HSE Specialist
Year 5: 2015-2016		
Joshua Reed	MS	Consolidated Grain and Barge/Regional Safety and Health Associate
Meghan Mattmiller	MS	Georgia-Pacific/Safety Consultant
Rachel Ragovin	MS	Summit/Loss Control
Kaitlin Budnick	MS	Lyondell Basel/Safety Engineer

Table 6. Faculty – Occupational Safety and Health

Core Faculty

Dr. Tracey Wortham, PE, <i>Coordinator</i>	Chair, Ergonomics, Biomechanics
Dr. Bassam Atieh	M.S. Advisor, Industrial Hygiene, Biostatistics
Ms. Julie Boyd	Industrial Hygiene, Safety Management
Dr. Traci Byrd, EMT-B	Emergency Medical Training
Dr. David Fender, CSP, CSHM	Online M.S. Advisor, Safety Management, Systems and General Safety
Dr. Raymond Godfrey	Construction Management
Dr. Randal Keller, CSP, CIH	Toxicology, Epidemiology, Occupational Diseases
Ms. Rasha Khalil, GSP	Industrial Hygiene
Ms. Cindy Medford, CSP	Safety Management
Dr. Gary Morris, CSP	Safety Management
Dr. Dilip Shah, MESH	Systems Safety, Environmental
Dr. Kristen Spicer	Risk Control/Management, Environmental

Adjunct Faculty

Ms. Susan Miller	Fire Safety, Safety Management
Mr. James Bryant, ARM, ALCM, CHMM	Loss Control/Risk Management
Mr. John Rudolph	Motor Fleet Safety, Environmental, System Safety

Supporting Faculty

Institute of Engineering

Dr. Michael Kemp	Environmental, Water Quality Technology
Dr. Steven Schneiderman	Solid and Hazardous Waste Management

OSH Training Center Staff/Instructors

Dr. Tracey Wortham, PE	Director, OSH Training Center
Dr. Traci Byrd, EMT-B	Assistant Director, OSH Training Center
Ms. Susan Miller	Lead Instructor
Mr. James Bryant, ARM, ALCM, CHMM	Instructor