

## **Final Progress Report**

NIOSH Training Grant No. 2 T03 OH008437  
Occupational Safety and Health Program Improvement

**July 1, 2016 - June 30, 2021**

Project Director: Tracey B. Wortham, Ph.D., P.E.  
Email: [twortham@murraystate.edu](mailto:twortham@murraystate.edu)  
Phone: (270) 809-6654  
Fax: (270) 809-3630

Murray State University  
Department of Occupational Safety and Health  
157 Industry and Technology Center  
Murray, KY 42071-3347

Submitted: September 2021

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## LIST OF ABBREVIATIONS

<b>AIHA</b>	American Industrial Hygiene Association
<b>ANSAC/ABET</b>	Applied and Natural Science Accreditation Commission of ABET
<b>ARM</b>	Associate Risk Management
<b>ASSE</b>	American Society of Safety Engineers
<b>ASSP</b>	American Society of Safety Professionals
<b>ASHM</b>	Associate Safety and Health Manager
<b>B.S.</b>	Bachelor of Science
<b>BCSP</b>	Board of Certified Safety Professionals
<b>CIH</b>	Certified Industrial Hygienist
<b>CPE</b>	Council on Postsecondary Education
<b>CSP</b>	Certified Safety Professional
<b>GSP</b>	Graduate Safety Practitioner
<b>HFES</b>	Human Factors and Ergonomics Society
<b>IHMM</b>	Institute of Hazardous Materials Management
<b>M.S.</b>	Master of Science
<b>MSU</b>	Murray State University
<b>NIOSH</b>	National Institute for Occupational Safety and Health
<b>OSH</b>	Occupational Safety and Health
<b>OSHTC</b>	Occupational Safety and Health Training Center
<b>SESHA</b>	Semiconductor Environmental Safety and Health Association
<b>TPG</b>	Training Project Grant
<b>URM</b>	Underrepresented Minority

## ABSTRACT

Project Director: Tracey B. Wortham, Ph.D., P.E.

Email: twortham@murraystate.edu

Phone: (270) 809-6654

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 OSH 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 a 100% online program with a concentration in safety management; a technical minor in occupational safety and health; and an undergraduate certificate in Emergency Management. Each degree provides a comprehensive broad-based educational background designed to prepare individuals for entry-level and advanced work in the safety field.

The undergraduate and graduate programs in OSH at Murray State are accredited by the Applied and Natural Science Accreditation Commission of ABET (ANSAC/ABET). Both programs were originally accredited by the American Society of Safety Engineers (ASSE) in 1988. Accreditation, along with curriculum changes and support from the National Institute for Occupational Safety and Health (NIOSH), serve to increase the visibility of the OSH programs at Murray State.

The project period of this NIOSH Training Project Grant (TPG) covered the period of July 1, 2016, through June 30, 2021. The grant support was used to strengthen the preparation of the graduate-level students to fill the demand for well-trained OSH professionals. This was accomplished by providing learning situations designed to help students become more effective entry-level and advanced professionals. The primary focus and major accomplishments were the following.

1. Increased involvement of the internship coordinator and intern/co-op supervisor(s) in visiting intern sites to observe and improve the internship experience;
2. Development and enhancement of interdisciplinary/multidisciplinary collaborations with programs in the Jesse D. Jones College of Science, Engineering and Technology;
3. On-going faculty and student academic and professional development to keep abreast of rapid changes in the occupational safety and health industry;
4. Development of seminars and expansion of OSH Training Center (OSHTC) programs designed to address current occupational safety and health issues;
5. Support for graduate trainees in the form of travel tuition and fees; and
6. Continued growth in activities and innovative approaches to recruitment and retention of Underrepresented Minority (URM) trainees.

## PROGRAM SUMMARY

The project period of this NIOSH TPG covered the period of July 1, 2016, through June 30, 2021. The purpose of the grant was to strengthen the preparation of the graduate-level students to fill the demand for well-trained OSH professionals. This was accomplished by providing learning situations designed to help students become more effective entry-level and advanced professionals. The primary focus and major accomplishments were the following.

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## TRAINING PROGRAM

**1. Increased involvement of the internship coordinator and intern/co-op supervisor(s) in visiting intern sites to observe and improve the internship experience.** A required internship/ co-op experience is considered to be one of the most important aspects of the occupational safety and health degree program. Utilizing travel funds, numerous interns and intern supervisors were visited to both maintain good working relationships with companies that are veteran employer participants in our internship program, as well as to grow relationships with first-year employers. During the COVID-19 pandemic, faculty meetings with interns and intern supervisors were held virtually. During the grant period, the OSH department placed 143 M.S. interns. Developing new and maintaining current department-employer relationships will only continue to be vital to allow our trainees to gain experiential learning and lead to full-time employment as well.

**2. Development and enhancement of interdisciplinary/multidisciplinary collaborations with programs in the Jesse D. Jones College of Science, Engineering and Technology.** One of the most impactful collaborations within the Jones College during this grant period, was the development and continued growth of the STEM+OSH Career Fair at Murray State (which is separate from the All Majors Fair.) This has been a great avenue for OSH students to seek internships/co-ops and fill the local, regional, and national need for safety professionals. During the COVID-19 pandemic, the STEM+OSH Career Fair was held virtually.

**3. On-going faculty and student academic and professional development to keep abreast of rapid changes in the occupational safety and health industry.** Faculty members have attended the following conferences/trainings: ABET Symposium; national and local/regional American Industrial Hygiene Association (AIHA) and American Society of Safety Professionals (ASSP) conferences; ASSP Future Safety Leaders Conference; Council of Postsecondary Education Employability (CPE) Convocation; Human Factors and Ergonomics Society (HFES) Annual Meeting; Industrial Site Visits; Kentucky Emergency Medical Services Conference and Expo; Kentucky Governor's Safety and Health Conference; OSHA 503 Update for General Industry Training; OSHA 510 Construction Training; Semiconductor Environmental Safety and Health Association (SESHA) 2019 Annual Conference; Society for Risk Analysis Conference;

Southern Company Contractor Safety Forum; and Tennessee Safety and Health Conference.

**4. Development of seminars and expansion of OSH Training Center programs designed to address current occupational safety and health issues.** The OSH department has sponsored seminars during the grant period covering both safety and nonsafety-related topics. Seminars include Human Performance Improvement by Lawrence Livermore National Labs; Professional Development Conference presented by 3M (multiple years); Bayesian Decision Analysis in Silica Surveillance Controls Management; Future of Virtual Reality in the Safety Field; Steelmaking Technology and Safety; Trench Safety; OSH and Human Resource's Common Needs and Responsibilities for ADA and HIPAA Compliance; Fall Protection in the Workplace; Safety and Health in the Chemical Industry; Public Health and Career Options; Slips, Trips, and Falls Workshop; Everyday, Real-life Experiences as a Kentucky State Police Officer; Motorcycle and Biking Safety; The Power of Influence: 5 Must Do's of Safety Leadership; Silica Controls Technologies; Prevention of Worker Injuries Using Ergonomics; Using Social Media to Effectively Communicate Your Safety Message; How to Handle Debt after College and Saving for Retirement; Presenting Skills Workshop; Real-life Finance that Students Need to Know; and How to Market Yourself for Success in Safety and Health.

In addition to the above mentioned seminars, the OSH Training Center has offered trainings in the following areas: 24 Hour Chemical Spill Response Technician Level Training; 8 Hour Chemical Spill Response Technician Level Refresher Training; 16 Hour Incident Command Training; 8 Hour Confined Space Entry Training; First Aid, CPR, AED Training; Forklift Safety; New Hire Safety Training (Hazard Communication; Emergency and Fire Procedures; PPE; Bloodborne Pathogens; and Asbestos Awareness); as well as well as training for Murray State's Residential Directors/Advisors (Emergency Procedures; Fire Safety; Fire Extinguisher Hands-on Training; and Crime Reporting).

Furthermore, as a part of the department's OSH placement services, numerous company information sessions occur in the department each semester by company representatives seeking to fill intern and/or full-time placement positions. Some companies include ADM, Amazon, BHP, Brasfield & Gorrie, Cargill, Chevron, Delta Faucet, Domtar, Eastman Chemical, GE Aviation, GM, Koch, Lyondellbasell, Marathon, PepsiCo, Quanta, Rosendin, Summit, and UCOR. This provides OSH students with first-hand knowledge of safety culture within various industry; provides networking opportunities for students; as well as allows company representatives to conduct interviews for internships and full-time job opportunities.

**5. Support for graduate trainees in the form of travel tuition and fees.** Thirty-three NIOSH supported trainees received tuition and fee support during the grant period. Twenty-nine trainees graduated with an M.S. in occupational safety and health and have either accepted a full-time position in the safety field or pursued a Ph.D. One trainee will graduate in August 2021 and is currently completing an internship with L. Keely Construction. Two trainees will be returning for the fall 2021 semester and are participating in internship experiences with Prairie State Energy and Raytheon Missiles and Defense.

Trainees have attended the following conferences which provide trainees with productive networking opportunities: national and regional/local AIHA and ASSP Conferences; ASSP Future Safety Leaders Conference; Industrial Site Visits; Kentucky Governor's Safety and Health Conference; SSHA 2019 Annual Conference; and the Southern Company Contractor Safety Forum.

## **6. Activities and Innovative Approaches to Recruitment for Underrepresented Trainees**

The Mentoring and Diversity Student Advisory Council was reintroduced with a new faculty advisor at the start of this grant period. Seminars are held each semester by the council in areas such as the importance of the mentor/mentee relationship and diversity in the workplace. Council members establish hours to be available in the department to speak to other students who need help in areas such as tutoring, preparing for a successful interview, and any other mentoring guidance that might arise. They also coordinate occupational safety and health job shadowing opportunities for students with local companies. The council and trainees assist in recruiting events and host a booth outside Murray State's STEM+OSH Career Fair each semester to mentor occupational safety and health students that have questions prior to entering the fair.

### **Accomplishments of Faculty**

- Successful reaccreditation approved by ANSAC/ABET in fall 2017. The program has been accredited since 1988.
- The occupational safety and health department celebrated its 40<sup>th</sup> anniversary in fall 2018.
- Dr. Yousif Abulhassan: Earned the Certified Safety Professional (CSP) certification; Received the Murray State Alumni Association Emerging Scholar Award; Received 2019 Board of Regents Teaching Excellence Award
- Dr. Bassam Atieh: Awarded the Omnicron Delta Kappa Outstanding Faculty Advisor of the Year
- Dr. Rupkatha Bardhan: Awarded Steel Manufacturers Association (SMA) and the AIST Foundation Don B. Daily Safety Grant to research Managing Heat Stress Related Injuries and Illness in the Iron and Steel Industry; Awarded the 2021 Board of Certified Safety Professionals (BCSP) Research-Early Stage Grant to will focus Managing Stress and Fatigue Among Truck Drivers
- Mrs. Julie Boyd: Earned the Certified Industrial Hygienist (CIH) certification; Awarded the 2021 BCSP Research-Doctoral Dissertation Grant to support research in Risk Assessment of the Industrial Hemp Processing Industry
- Dr. Traci Byrd: Received the 2021-2022 Neil Weber Award for Excellence in the Jones College of Science, Engineering, and Technology; Appointed to Kentucky's OSH Standards Board by Governor Beshear; Awarded best in presentation at ASSP Safety 2018; Served as the President of the Kentucky Safety and Health Network (KSHN)
- Dr. Oluwabunmi Dada: Earned the CSP certification; selected for the Academic Leadership Development Institute cohort of 2021 by the Kentucky CPE
- Dr. Randal Keller: Elected Chair of the Applied and Natural Science Commission of ABET (ANSAC/ABET) beginning in July 2021; Recognized as a Jesse D. Jones Endowed Professor by the Jones College of Science, Engineering, and Technology at Murray State; Received the Sandra Flynn Professor of the Year Award from Murray State's international student body
- Mrs. Rasha Khalil: Earned the CSP certification
- Dr. Gary Morris -Awarded an IPA for COVID-19 assistance grant from NIOSH to provide expertise and technical assistance to assist employers, workers, government and public health officials with responding to the COVID-19 pandemic
- Dr. David Wilbanks: Received the Associate in Risk Management (ARM) designation; Received 2020 Board of Regents Teaching Excellence Award

### **TRAINEES**

#### **Update on Trainees – Degrees Earned and Current Status**

Thirty-three NIOSH supported trainees received tuition and fee support during the grant period. Twenty-nine trainees graduated with an M.S. in occupational safety and health and have either accepted a full-time position in the safety field or pursued a Ph.D. One trainee will graduate in

August 2021 and is currently completing an internship with L. Keely Construction. Two trainees will be returning for the fall 2021 semester and are participating in internship experiences with Prairie State Energy and Raytheon Missiles and Defense.

### **Description of Trainees' Research Projects, Honors/Awards, Scholarships, Theses and Dissertations or Other Relevant Information**

- ASSP Student Section received the Outstanding Student Section Award, 2020.
- Trainees received approximately \$98,000 in scholarships from various private industries and professional organizations including 3M; AHIA, ASSP, and BCSP Foundation; Brown-Forman Lomer Johnson Memorial; Chevron; Kentucky Safety and Health Network; Southern Company Contractors Safety Forum; and SSHA.
- Trainees serve as facilitators at the annual Kentucky Governor's Safety and Health Conference.
- Upon graduation, M.S. occupational safety and health students are eligible to receive the Graduate Safety Practitioner (GSP) designation and the Associate Safety and Health Manager (ASHM) designation.
- Each year trainees present at Murray State's Scholar's Week. Presentation topics during this grant period include An Ergonomic Assessment at a Dairy Production Plant; Telecommunications Fabrication Facility Ergonomics; An Ergonomic Assessment of the Wine and Spirit Industry; and A Cutting Edge Approach of Assessing Ergonomic Risks in the Semiconductor Industry.
- Trainees also present at regional professional meetings. Topics presented at the annual Tennessee Valley Section of AIHA Conference include Comparison of Ergonomic Risk Factors in Labor Intensive Agriculture Jobs; Ergonomic Related Work Practices and Injuries during Tobacco Harvest; Applications of RFID Technology in Search and Rescue Operations; and Challenges of Industrial Hygiene Monitoring in a Refinery. Trainees also present at national conferences including the national SSHA conference, earning second place for a poster presentation on A Cutting Edge Approach for Assessing Ergonomic Risks in the Semiconductor Industry; the national ASSP conference, earning best student research poster presentation on Teamwork: A Determinant of Safety Climate in a Small Rural Hospital Setting; and the HFES conference.
- Each M.S. student in the occupational safety and health program at Murray State is required to complete a culminating project to combine academics, trainings, and hands-on learning into a cohesive project. Trainee culminating projects include Effects of Electronic Cigarettes on Company Health and Safety Policies; Noise Exposure in Recreational Fishing Boats; The Need for Heating Protection Programs at Small Airports; Health Effects of Grain Dust Inhalation; Pedestrian Safety Around Moving Equipment; Attributing Factors that Influence Workers Compensation Claims: How to Mitigate Claims; Virtual Reality: How Can It Benefit the Safety Profession; Recreational Noise; How Artificial Intelligence and Automation is Currently Being Used in Industry to Benefit Worker Safety and Health; A Study of Metabolic Processes of Long-Haul Truck Drivers; Heat Stress and Heat-Related Illness; Offshore Petroleum and the Hazard of Fatigue; Safety and Health in Collision Sports and Arena Safety; Risk Factors for Developing Musculoskeletal Disorders During Tobacco Harvest; High Altitude Effects on Workers; Musculoskeletal Disorders (MSD) in Construction; Agriculture Operations and How Certain Fertilizers and Pesticides Affect our Environment; Asbestos and Its Complicated History: Health Effects and How the Substance Reached Its Infamous Reputation; and Silica in the Construction Industry.

During the final year of this grant period, we had to adjust to limitations set by COVID. The OSH department followed university-mandated pandemic protocols based on guidelines from the CDC and the Governor of Kentucky. Three OSH faculty members served on the university's

“Racer Restart Committee” to develop and implement pandemic protocols for the university. The OSH program continues to remain flexible in adapting to ongoing changes during the pandemic (e.g., masking, social distancing, classroom capacities, course delivery methods, virtual meetings, virtual company information sessions and interviewing).

Each semester, the department compiles and emails our company contacts digital links containing our students’ resumes for those seeking both internships and full-time placement. We moved our normally in-person company information sessions and interviews to virtual. Murray State, with the help of the platform Handshake, set up the STEM+OSH Career Fair virtually.

Internships adjusted based on individual company policy, with a small number implementing virtual internships. The majority of internships continued in-person, with many student interns helping to develop and implement company COVID-19 protocols. In summer 2020, we placed a total of 58 interns (18 M.S. students and 40 B.S. students), in 16 states and one international country. In summer 2021, we placed a total of 87 interns (26 M.S. students and 61 B.S. students), in 24 states and 1 international country. The OSH program continues to remain fluid to adapt to changing conditions.

## **PUBLICATIONS**

There have been no publications resulting from the grant.

## **CONCLUSIONS**

With over forty years of experience in educating OSH students, the OSH department at Murray State, with ongoing support of the NIOSH TPG, will continue to strengthen the learning environment to prepare the next generation of leaders in OSH practice. The continuous improvement process for ABET accredited programs requiring the regular use of appropriate documented processes for assessing and evaluating the program helps to maintain our solid academic curriculum. With both our internal OSH placement services, as well as the Murray State STEM+OSH Career Fair, students are provided avenues to develop their resumes, practice interviews, and be fully prepared to seek internships and full-time jobs. Preserving and growing our good working relationships with companies allows students to gain hands-on internship experiences in the safety field, as well as an avenue to network to seek full-time jobs upon graduation. Through student organizations, company information sessions, and the OSH Training Center, students have many opportunities to seek additional hands-on training and participate in safety-related seminars. With recognition from BCSP and the Institute of Hazardous Materials Management (IHMM), students graduating from our programs, are eligible for designations (GSP and ASHM respectively).

Since the start of the grant period, the OSH department has graduated 151 M.S. students in occupational safety and health. Thirty-three of these students were direct NIOSH supported trainees, receiving travel and tuition and fee support. Twenty-nine of these trainees graduated with an M.S. in occupational safety and health and have either accepted a full-time position in the safety field or pursued a Ph.D. One trainee will graduate in August 2021 and is currently completing an internship with L. Keely Construction. Two trainees will be returning for the fall 2021 semester and are participating in internship experiences with Prairie State Energy and Raytheon Missiles and Defense. Since the start of the grant period, 143 M.S. students have participated in occupational safety and health internship/co-op opportunities. The OSH department at Murray State makes every effort to ensure students receive a solid education, receive hands-on training, and are placed to their best educational advantage.