

CTE Program Narrative

NAME OF COLLEGE: Bakersfield College

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DATE: March 13, 2017

DIVISION: Engineering/Industrial Technology

FACULTY: Catherine Jones

PROGRAM NAME: Occupational Safety and Risk Management

REASON FOR APPROVAL REQUEST (Check One):

- New Program Proposal
- Program Revision Proposal (Substantial or TOP Code Changes)
- Locally Approved

TYPE OF DEGREE:

- Certificate of Achievement
- Associate of Arts
- Associate of Science
- Associate of Arts for Transfer
- Associate of Science for Transfer
- Other

TRANSFER APPLICABILITY: Yes No

ATTACHMENTS/INFORMATION REQUIRED:

Labor/Job Market Data and Analysis
Advisory Committee Meeting Minutes
List of Advisory Committee Members

Employer Survey, if applicable

1. Statement of Program Goals and Objectives

Identify the goals and objectives of the program. For CTE programs, the statement must include the main competencies students will have achieved that are required for a specific occupation. The statement must, at a minimum, clearly indicate the specific occupations or fields the program will prepare students to enter and the basic occupational competencies students will acquire.

If the program is selective, describe relevant entry criteria and the selection process for admission to the program. Specify all mandatory fees that students will incur for the program aside from the ordinary course enrollment fee.

This AS degree provides the necessary foundation for a career in the occupational safety and risk management profession. The objectives of this program are to provide students with the necessary educational base to secure employment after obtaining the AS degree, to meet the education requirement for individuals pursuing professional certification, and to provide a pathway into a discipline related Baccalaureate program.

Program Learning Outcomes:

1. Students will demonstrate competency in risk assessment and the measurement, analysis, and interpretation of health and safety data.
2. Students will be able to design and provide appropriate safety education and training.
3. Students will be able to design and apply appropriate risk control methods, procedures, and programs incorporating current regulations and utilizing appropriate technology.
4. Students will demonstrate knowledge of contemporary occupational safety and risk management issues within the local, regional and societal context and apply the applicable regulatory framework.

2. Catalog Description

Enter exactly as it will appear in the catalog, including program outcomes. The description must also

- *Convey the certificate's goals(s) and objectives*
- *Provide an overview of the knowledge and skills that students who complete the requirements must demonstrate (student learning outcomes)*
- *List all prerequisite skills or enrollment limitations*
- *Mention any risks, such as occupations that are inherently competitive or low-salaried and/or occupational areas where inexperienced graduates are not generally hired.*
- *For CTE programs, the description must list the potential careers students may enter upon completion.*
- *Convey what the student may expect as an outcome*

If applicable, reference accrediting and/or licensing standards. If there is a widely recognized certification

provided by a professional association, specify whether the program will fully prepare completers for the recognized professional certification.

The degree provides broad based professional preparation in the field of occupational safety and risk management. The curriculum uses scientific foundations and regulatory frameworks and includes courses in occupational safety, occupational health, risk management, and environmental health. Elective courses, paired with the core courses, allow for specialization in agriculture, business, and health science. Students are academically prepared to make contributions to society by anticipating, evaluating, and controlling occupational and environmental hazards and risks. Career opportunities are broad throughout industry and are also found in government agencies such as cities, counties, schools. Practice specialties within this discipline include construction, engineering, environmental, ergonomics, fire protection, industrial hygiene, oil & gas, risk management/insurance, transportation, and utilities.

3. Program Requirements

The program requirements must be consistent with the catalog description. The number of units, specific course requirements and the sequence of the courses must be coherent, complete and appropriate. Display the program requirements in a table format that includes all courses required for completion of the program (core requirements and required or restricted electives), subtotal of core units, and total program units. For each course, indicate the course department number, course title, and unit value.

Program requirements and sequence: See attached.

The OSRM program is structured to accommodate areas of special interest and specific disciplines within the safety/risk management profession resulting in the option to pursue 1 of 4 AS types. Those include OSRM Agriculture, OSRM Business, OSRM General Industry, and OSRM Health Science.

Pathways are designed to accommodate a Bakersfield College General Education Pattern as well as a CSU Transfer Pattern. Both are reflected in the attachments.

4. Master Planning (Background and Rationale)

Given the stated goals and objectives, address the role the proposed program will fulfill in the college's mission and curriculum offerings. This discussion may include some history of the program proposal origins, a description of the program purpose, and/or the program's relevancy for the region and college.

The proposal must demonstrate a need for the program that meets the stated goals and objectives in the region the college proposes to serve with the certificate. A proposed new certificate must not cause undue competition with an existing program at another college.

If any expenditures for facilities, equipment or library and learning resources are planned, please explain the specific needs in this section.

If the program is to be offered in close cooperation with one or more specific employers, a discussion of the relationship must be provided.

The core mission of Bakersfield College is to provide opportunities for students from diverse backgrounds to obtain Associate degrees and transfer preparation to Baccalaureate programs. The programs and learning environment is intended to foster student's ability to think critically, communicate effectively, and demonstrate competency and skills necessary to engage productively in their communities and the world.

The OSRM program aligns with this mission by meeting an existing local need for providing students with the necessary educational base to secure employment after obtaining the AS degree. No other program in the region offers the opportunity to obtain an AS degree in OSRM with a specific emphasis, i.e. Agriculture. This structure aligns with the broad practice specialties that exist within the discipline.

Bakersfield College launched its Baccalaureate program in Industrial Automation with strong support from industry partners. Recognizing that the majority of those partners also have safety, risk management, and compliance issues as integral components of their operations, many of the same industry partners also support the creation of the OSRM program and serve on the OSRM advisory committee.

5. Need for Program

a. Enrollment and Completer Projections

Address and justify the number of projected students or "annual completers" to be awarded the certificate each year after the program is fully established.

Once the program is fully established, approximately 20 annual completers are projected. This program is strongly supported by local industry. The local labor market is strong with potential Kern County employers existing in the following industries:

- Aerospace & Defense
- Agriculture
- Construction
- Energy & Natural Resource
- Government
- Transportation
- Manufacturing

b. Labor Market Information (LMI)

Summarize the Labor Market Information (LMI) and employment outlook (Including citation for the source of the data) for students exiting the program.

Enter table or chart as a separate attachment.

According to the Bureau of Labor Statistics (BLS), "Employment of occupational health and safety specialists and technicians is expected to increase 9 percent during the 2006-2016 decade, about as fast as the average for all occupations, reflecting a balance of continuing public demand for a safe and healthy work environment against the desire for smaller government and fewer regulations. Emergency preparedness will continue to increase in importance, creating demand for these workers. More specialists will be needed to cope with technological advances in safety equipment and threats, changing regulation, and increasing public expectation. In private industry, employment growth will reflect overall business growth and continuing self-enforcement of government and company regulations and policies. Over the past two decades, insurance and worker's compensation costs have risen and have become a financial concern for many employers and insurance companies. As a result, job growth should be good for those specializing in loss prevention, especially in construction safety and in ergonomics."

BLS reports the median annual earnings of occupational health and safety specialists and technicians as \$54,920 (2006). It is important to note that with certification, professionals earn up to \$30,000 more per year (according to a 2015 salary survey conducted by the American Society of Safety Engineers (ASSE)). The ASSE salary survey reported a median salary of \$85.00/hour for safety professionals with an Associate degree.

The National Institute for Occupational Safety and Health (NIOSH) sponsored the National Assessment of the Occupational Safety and Health Workforce in 2011 and reported an 11 percent increased demand for safety and health professionals in the year 2018. The study also noted that the number of safety and health professionals employers expect to hire in 2011 moving forward is "substantially higher than the number estimated to be produced from OS&H programs."

c. Employer Survey (if applicable)

When strong LMI data is not available, an employer survey may be submitted. Provide a copy of the survey, including the number of those surveyed, number of responses, and a summary of the results. The survey must address the extent to which the proposed degree or certificate will be valued by employers.

na

6. Place of Program in Curriculum/Similar Programs

Review the college’s existing program inventory, then address the following questions:

- Do any active inventory records need to be made inactive or changed in connection with the approval or the proposed program? If yes, please specify.
- Does the program replace any existing program(s) on the college’s inventory? Provide relevant details if this program is related to the termination or scaling down of another program(s).
- What related programs are offered by the college?

This program does not change or replace any existing programs.
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7. Similar Programs at Other Colleges in Service Area

List similar programs offered at other colleges within the Central/Mother Lode Region that may be adversely impacted. Enter ‘none’ if there are no similar programs.

College	Program
Taft College	Industrial Safety (However, this program is not similar to the areas of emphasis being pursued with this new program (Agriculture, Business, Health Science, General Industry)

Supporting documentation required

Labor Market Information

In a separate attachment, provide current Labor Market Information showing that jobs are available for program completers within the local service area. Statewide or national LMI may be included as supplementary support but evidence of need in the specific college service area or region is also necessary.

List of Members of Advisory Committee

This list must include advisory committee member names, job titles, and affiliations.

Name	Title	Affiliation
Joe Barifi	Manager Environmental Health & Safety, and Professor	Aera Energy/CSUB
Joel Sherman	Director Environmental Health & Safety, Compliance, and Workers' Compensation	Grimmway Farms
John Pryor	Principal	Risk Management Consultant
Ben Laverty III	President	California Safety Training Corp
Jeff Rasmussen	President	Kern County Farm Bureau
Paul Niemer	Safety/Personnel Development Director	Sierra Pacific Industries
Jose Perez	Sr. Manager Environmental Health and Safety	Wonderful Company
Vicky Furnish	Environmental Specialist	Southern California Edison

Recommendation of Advisory Committee (Meeting Minutes)

In a separate attachment, provide minutes of the advisory committee meetings at which the program was discussed and approved, with relevant areas highlighted, as well as a summary of the advisory committee recommendations.

BAKERSFIELD COLLEGE

Occupational Safety and Risk Management Advisory Committee

Minutes

March 10, 2017

1. Committee Members Present:

Jeff Rasmussen, Joe Barifi, Joel Sherman, John Pryor, Ben Laverty III

Bakersfield College Faculty Present: Catherine Jones

Members consulting asynchronously and providing input electronically:

Jose Perez, Paul Niemer, Vicky Furnish

2. Program Goals and Objectives: The group discussed the foundational objectives of the program and validated as follows:

- Provide students with the necessary educational base to secure employment after obtaining the AS degree.
- Meet the minimum educational requirement for individuals pursuing professional certifications.
- Provide a pathway into a discipline related Baccalaureate program.

The committee voiced strong support for the creation of the OSRM program and confirmed the need for such professionals locally and regionally. Representatives on the committee represent various industries and disciplines and all agreed on the need for educationally trained safety professionals. Locally, Agriculture is in great need and strongly supports the program. Catherine will attend an upcoming meeting with the Kern County Farm Bureau to discuss the program.

3. Core Course Overview: The core courses were reviewed for content and scope with minor adjustments being made to add, arrange, or clarify content on each course.

Revisions will be made per discussion and course outlines will be updated. Overall, the committee voiced support of the structure and curriculum content.

4. AS Degree and Certificate Offering: The committee supported the scope of the program resulting in four degree paths (Agriculture, Business, General Industry, and Health Science). Offering differing options acknowledges the wide areas of emphasis within the profession. The areas of emphasis also better align with transfer options for students desiring to continue to Baccalaureate programs. The committee was not supportive of offering any level of certificate below AS. AS is the minimum level of education required to pursue the Certified Safety Professional designation, which is the industry and professional standard. There was much discussion regarding certificate programs, including prior local programs, that did not result in properly preparing students for employment, nor do certificates translate to increased employment opportunities. Maintaining the integrity of the level of professionalism and education required to be a successful safety professional was of concern to the committee and therefore it was a unanimous decision that any type of certificate should not be offered.

5. Student Education Plan Pathways: The committee briefly discussed the various pathways associated with an area of emphasis. Ensuring there is a CSU transfer path for each is a priority.

Occupational Safety and Risk Management Degree Pathways/Emphasis

Program Core:

OSRM 10 Occupational Safety
OSRM 12 Occupational Health
OSRM 16 Managing Employee Safety and Health
OSRM 18 Occupational Regulations and Regulators
OSRM 20 Environmental Health and Hazardous Materials
OSRM 26 Risk Management*

Agriculture:

AGRI B1 Agriculture, Environment, and Society
CRPS B3 Integrated Pest Management
MCAG B4 Agriculture Safety

choose one of the following:

CRPS B1 Principles of Crop Production
ANSC Introduction to Animal Science
SOIL B1 Introduction to Soil Science

Business:

BSAD B1 Financial Accounting
BSAD B2 Managerial Accounting
BSAD B18 Business Law
BSAD B20 Intro to Business
BSAD B61 Human Resource Management

Required General Education:

MATH B22 Elementary Probability and Statistics
BIOL B18 Essentials of Human Anatomy and Physiology
PHSC B12 Physical Science

General Industry:

FIRE B6 Fire Protection Equipment and Systems
FIRE B70d Hazardous Materials Technician/Basic Chemistry
FIRE B70e Hazardous Materials Technician/Applied Chemistry

choose one of the following:

CRPS B3 Integrated Pest Management
CONST B1 Introduction to Construction
ELET B1 Basic Electronics
WELD B1B Introduction to the Welding Processes

Health Science:

PBHS B20 Introduction to Public Health
PHED B42 Introduction to Kinesiology
MEDS B60 Medical Terminology

choose one of the following:

PBHS B22 Drugs, Health, and Society
PBHS B23 Health and Social Justice

* not required for Health Science

Bakersfield College
 Student Education Plan - BC General Education Pattern
 AS Occupational Safety and Risk Management: Agriculture

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B22	B.2	4
CRPS B1 or ANSC B1 or SOIL B1	B.1	3
BIOL B18*		4
		17

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
COMM B8	A.1	3
AGRI B1*	D.1/EP	3
PHSC B12*		4
		16

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
HIST B18	D.3	3
CRPS B3*		3
COMM B5		3
		15

Fourth Semester	Gen Ed	Units
OSRM B20*		3
MCAG B4*		3
SPAN B1*	C.1/C.2	4
PHED B36	E	3
Physical Education	E	1
		14

TOTAL UNITS 62

*Major courses required in program = 39

Required Agriculture Courses:

AGRI B1 Agriculture, Environment, & Society
 CRPS B3 Integrated Pest Management
 MCAG B4 Agriculture Safety

Agriculture Courses (choose one):

CRPS B1 Principles of Crop Production
 ANSC B1 Introduction to Animal Science
 SOIL B1 Introduction to Soil Science

Bakersfield College
 Student Education Plan - CSU General Education Pattern
 AS Occupational Safety and Risk Management: Agriculture

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B22	B.4	4
STDV B6	E	3
BIOL B18*	B.2/D	4
		17

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
COMM B8	A.1	3
AGRI B1*	D	3
PHSC B12*	B.1	4
		16

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
HIST B18	C.2	3
CRPS B3*		3
COMM B5	A.3	3
		15

Fourth Semester	Gen Ed	Units
OSRM B20*		3
MCAG B4*		3
SPAN B1*	C.2	4
SOCI B1	D	3
ART B1	C.1	3
		16

TOTAL UNITS 64

*Major courses required in program = 39

Required Agriculture Courses:

AGRI B1 Agriculture, Environment, & Society

CRPS B3 Integrated Pest Management

MCAG B4 Agriculture Safety

Bakersfield College
 Student Education Plan - BC General Education Pattern
 AS Occupational Safety and Risk Management

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B22	B.2	4
BIOL B18*	B.1	4
STDV B6	EP	2
		16

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
COMM B1	A.1	3
FIREB6*		3
FIRE B70d*		2
		14

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
SOCI B1	D.1	3
FIRE B70e*		2
PHED B36	E	3
		14

Fourth Semester	Gen Ed	Units
OSRM B20*		3
PHSC B12*		4
course from list below		3
POLS B12	D.3	3
SPAN B1*	C.1/C.2	4
		17

Additional Requirements	Gen Ed	Units
Physical Education	E	1
		1

TOTAL UNITS 62

*Major courses required in program = 37 units

FIRE B6 Fire Protection Equipment and Systems
 FIRE B70d Hazardous Materials Technician/Spec Basic Chemistry
 FIRE B70e Hazardous Materials Technician/Spec Applied Chemistry

choose one

CRPS B3 Integrated Pest Management
 CONST B1 Introduction to Construction
 ELECT B1 Basic Electronics
 WELD B1B Introduction to the Welding Processes

Bakersfield College
 Student Education Plan - CSU General Education Pattern
 AS Occupational Safety and Risk Management

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B22	B.4	4
BIOL B18*	B.2	4
STDV B3	E	3
		17

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
COMM B1	A.1	3
FIREB6*		3
FIRE B70d*		2
		14

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
SOCI B1	D	3
FIRE B70e*		2
HIST B18	C.2/D	3
ART B1	C.1	3
		17

Fourth Semester	Gen Ed	Units
OSRM B20*		3
PHSC B12*	B.1	4
COMM B5	A.3	3
POLS B12	D	3
SPAN B1*	C.2	4
		17

TOTAL UNITS 65

*Major courses required in program = 37 units

FIRE B6 Fire Protection Equipment and Systems

FIRE B70d Hazardous Materials Technician/Spec Basic Chemistry

FIRE B70e Hazardous Materials Technician/Spec Applied Chemistry

Bakersfield College
 Student Education Plan - BC General Education Pattern
 AS Occupational Safety and Risk Management: Business

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B23	B.2	3
CRPS B1	B.1	3
STDV B1	EP	0.5
BSAD B20*		3
		15.5

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
BSAD B2*		3
BSAD B20*	D.1	3
COMM B1 or COMM B4	A.1	3
		15

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
BSAD B61*		3
BSAD B1*		4
Physical Education	E	1
		14

Fourth Semester	Gen Ed	Units
OSRM B20*		3
BSAD B18*		3
POLS B12		3
HIST B18	D.3	3
SPAN B1	C.1/C.2	4
		16

TOTAL UNITS 60.5

*Major courses required in program

- BSAD B20 Introduction to Business
- BSAD B1 Financial Accounting
- BSAD B2 Managerial Accounting
- BSAD 18 Business Law
- BSAD B61 Human Resource Management

Bakersfield College
 Student Education Plan - CSU General Education Pattern
 AS Occupational Safety and Risk Management: Business

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B23	B.4	3
STDV B3	E	3
BSAD B20*		3
		15

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
SOCI B1	D.10	3
ART B1	C.1	3
COMM B1 or COMM B4	A.1	3
		15

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
BSAD B61*		3
BSAD B1*		4
COMM B5	A.3	3
CRPS B5 or BIOL B18	B.2	3
		19

Fourth Semester	Gen Ed	Units
PHSC B12	B.1	4
BSAD B18*		3
POLS B12	D.8	3
HIST B18	C.2/D.6	3
SPAN B1	C.2	4
		17

TOTAL UNITS 66

*Major courses required in program

- BSAD B20 Introduction to Business
- BSAD B1 Financial Accounting
- BSAD 18 Business Law
- BSAD B61 Human Resource Management

Bakersfield College
 Student Education Plan - BC General Education Pattern
 AS Occupational Safety and Risk Management: Health Science

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B22	B.2	4
BIOL B18	B.1	4
STDV B6	EP	2
		16

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
COMM B1	A.1	3
PBHS B20		3
Physical Education	E	1
		13

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
COMM B5		3
PBHS B22 or PBHS B23		3
SOCI B1	D.1	3
		15

Fourth Semester	Gen Ed	Units
HIST B18 or POLS B12	D.3	3
MEDS B60		3
PHED B36	E	3
PHED B42		3
SPAN B1	C.1/C.2	4
		16

TOTAL UNITS 60

*Major courses required in program

- PBHS B20 Introduction to Public Health
- PBHS B22 Drugs, Health, and Society
- PBHS B23 Health and Social Justice
- PHED B42 Introduction to Kinesiology
- MEDS B60 Medical Terminology

Bakersfield College
 Student Education Plan - CSU General Education Pattern
 AS Occupational Safety and Risk Management: Health Science

First Semester	Gen Ed	Units
OSRM B10*		3
OSRM B18*		3
MATH B22	B.4	4
BIOL B18	B.2	4
STDV B6	E	2
		16

Second Semester	Gen Ed	Units
OSRM B12*		3
OSRM B16*		3
COMM B1	A.1	3
PBHS B20		3
PHSC B12	B.1	4
		16

Third Semester	Gen Ed	Units
OSRM B26*		3
ENGL B1a	A.2	3
COMM B5	A.3	3
PBHS B22 or PBHS B23		3
SOCI B1	D	3
		15

Fourth Semester	Gen Ed	Units
HIST B18	C.2/D	3
MEDS B60		3
PHED B36	E	3
PHED B42		3
POLS B12	D	
		12

Additional Requirements	Gen Ed	Units
SPAN B1	C.2	4
ART B1	C.1	3
		7

TOTAL UNITS 66

*Major courses required in program

- PBHS B20 Introduction to Public Health
- PBHS B22 Drugs, Health, and Society
- PBHS B23 Health and Social Justice
- PHED B42 Introduction to Kinesiology
- MEDS B60 Medical Terminology

Job Outlook

<http://www.asse.org/professionalaaffairs/job-outlook/>

The following information on job outlook for the occupational safety and health profession comes directly from The Bureau of Labor Statistics.

"Employment of occupational health and safety specialists and technicians is expected to increase 9 percent during the 2006-16 decade, about as fast as the average for all occupations, reflecting a balance of continuing public demand for a safe and healthy work environment against the desire for smaller government and fewer regulations. Emergency preparedness will continue to increase in importance, creating demand for these workers. More specialists will be needed to cope with technological advances in safety equipment and threats, changing regulations, and increasing public expectations. In private industry, employment growth will reflect overall business growth and continuing self-enforcement of government and company regulations and policies.

Over the past two decades, insurance and worker's compensation costs have risen and have become a financial concern for many employers and insurance companies. As a result, job growth should be good for those specializing in loss prevention, especially in construction safety and in ergonomics."

Potential Salary

"Median annual earnings of occupational health and safety specialists and technicians were \$54,920 in May 2006. The middle 50 percent earned between \$41,800 and \$70,230. The lowest 10 percent earned less than \$32,230, and the highest 10 percent earned more than \$83,720. Median annual earnings in the industries employing the largest numbers of occupational health and safety specialists and technicians in May 2006 were:

- Federal Government \$68,890
- Management, scientific, and technical consulting services 63,130
- General medical and surgical hospitals 59,200
- Local government 52,110
- State government 49,690

Most occupational health and safety specialists and technicians work in large private firms or for Federal, State, and local governments, most of which generally offer benefits more generous than those offered by smaller firms."

For more information about job outlook for the occupational safety and health profession, visit the BLS Occupational Outlook Handbook 2008 -2009 Edition.

Commentary from ASSE: The information from the BLS Occupational Outlook Handbook is good news for the safety profession. Job growth is in line with many other professions - industry, government, and the education sector will all continue to hire SH&E professionals.

As you can see from the information contained in the Occupational Outlook Handbook, there will be job opportunities for new SH&E professionals to enter the field as older professionals retire. However, the Occupational Outlook Handbook does not necessarily have the insider's perspective on potential opportunities for new members of the profession. For decades, ASSE has expressed concern that a large number of individuals will begin to retire from the safety profession, leaving a gap in the SH&E workforce. This, in theory, is because many people started their careers in safety after the Occupational Safety and Health Act of 1970. The legislation brought an increasing amount of attention on workplace safety and many people seized the opportunity to enter a profession that was in high-demand by companies at the time. Now, almost 40 years later, many of the people that entered the profession around 1970 will, and have, started to retire. As these veteran safety professionals leave the field, it will create a demand for new SH&E professionals. While there is not necessarily research to support this commentary, anecdotally, members of ASSE have long expressed concern that the supply of SH&E professionals will not be able to keep with demand once veteran SH&E professionals start to retire in large numbers.

Subfields and Emerging Specialty Areas

The kind of work that a safety professional does varies widely depending on each individual's education, experience, and unique passions to protect people, property and the environment. Below are a few subfields and emerging specialty areas that SH&E professionals concentrate on to put a unique spin on their careers!

Emergency Management	Fire Protection and Engineering
Engineering	Fire Science
Engineering Technology	Health Physics
Environmental	Industrial Hygiene
Environmental Engineering	Mining Engineering
Environmental Health	Public Health
Ergonomics	Public Safety
Fire Protection	Risk Management
Fire Protection and Safety	Security

ASSE has also identified specific industries or fields where safety professionals often work. Within ASSE, these groups are called Practice Specialties and they include:

Academics	International
Construction	Management
Consultants	Human Resources
Engineering	Manufacturing
Environmental	Mining
Fire Protection	Oil and Gas
Healthcare	Public Sector
Industrial Hygiene	Risk Management
Ergonomics	

Occupational Employment Statistics

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Occupational Employment and Wages, May 2015

17-2111 Health and Safety Engineers, Except Mining Safety Engineers and Inspectors

Promote worksite or product safety by applying knowledge of industrial processes, mechanics, chemistry, psychology, and industrial health and safety laws. Includes industrial product safety engineers.

- [National estimates for this occupation](#)
- [Industry profile for this occupation](#)
- [Geographic profile for this occupation](#)

National estimates for this occupation: [Top](#)

Employment estimate and mean wage estimates for this occupation:

Employment (1)	Employment RSE (3)	Mean hourly wage	Mean annual wage (2)	Wage RSE (3)
24,900	1.9 %	\$42.21	\$87,810	0.6 %

Percentile wage estimates for this occupation:

Percentile	10%	25%	50% (Median)	75%	90%
Hourly Wage	\$23.76	\$30.83	\$40.68	\$52.16	\$62.87
Annual Wage (2)	\$49,410	\$64,120	\$84,600	\$108,490	\$130,770

Industry profile for this occupation: [Top](#)

Industries with the highest published employment and wages for this occupation are provided. For a list of all industries with employment in this occupation, see the [Create Customized Tables](#) function.

Industries with the highest levels of employment in this occupation:

Industry	Employment (1)	Percent of industry employment	Hourly mean wage	Annual mean wage (2)
Nonresidential Building Construction	2,130	0.29	\$39.58	\$82,330
Architectural, Engineering, and Related Services	2,100	0.15	\$45.24	\$94,090
Utility System Construction	1,360	0.28	\$37.82	\$78,670
Local Government (OES Designation)	1,300	0.02	\$33.86	\$70,430
Management, Scientific, and Technical Consulting Services	1,100	0.09	\$44.67	\$92,910

Industries with the highest concentration of employment in this occupation:

Industry	Employment (1)	Percent of industry employment	Hourly mean wage	Annual mean wage (2)
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	450	0.48	\$44.63	\$92,830
Basic Chemical Manufacturing	610	0.41	\$47.81	\$99,440
Petroleum and Coal Products Manufacturing	370	0.34	\$52.80	\$109,820
Nonresidential Building Construction	2,130	0.29	\$39.58	\$82,330
Utility System Construction	1,360	0.28	\$37.82	\$78,670

Top paying industries for this occupation:

Industry	Employment (1)	Percent of industry employment	Hourly mean wage	Annual mean wage (2)
Oil and Gas Extraction	410	0.21	\$54.51	\$113,380
Natural Gas Distribution	90	0.08	\$53.32	\$110,910
Metalworking Machinery Manufacturing	70	0.04	\$53.30	\$110,860

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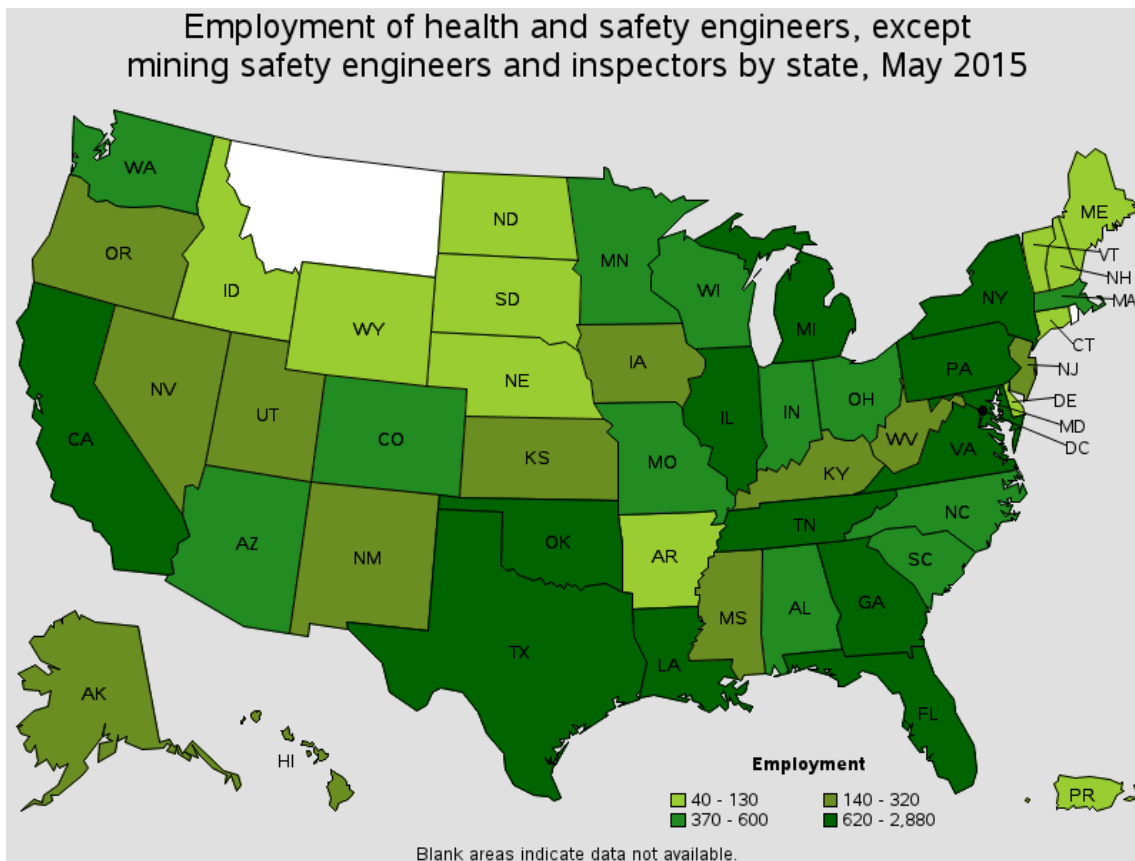
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Petroleum and Coal Products Manufacturing	370	0.34	\$52.80	\$109,820
Federal Executive Branch (OES Designation)	680	0.03	\$51.16	\$106,420

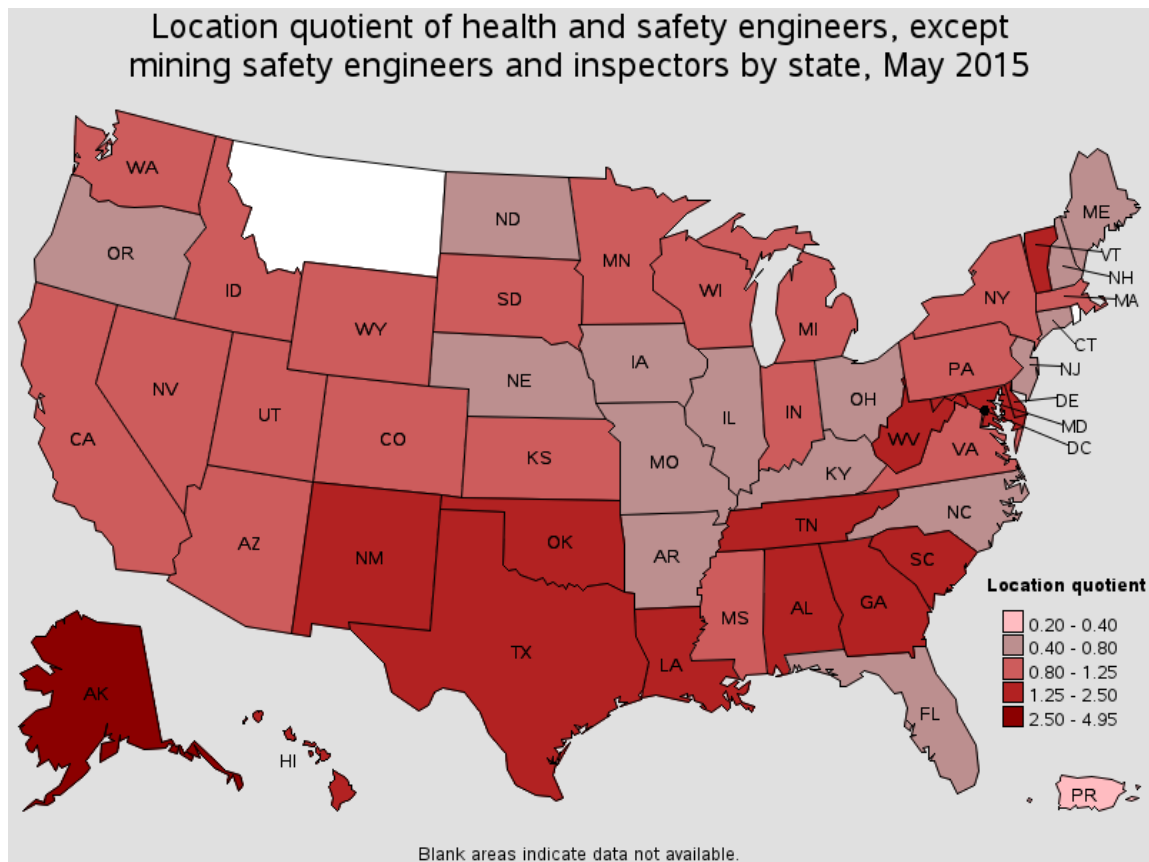
Geographic profile for this occupation: [Top](#)

States and areas with the highest published employment, location quotients, and wages for this occupation are provided. For a list of all areas with employment in this occupation, see the [Create Customized Tables](#) function.



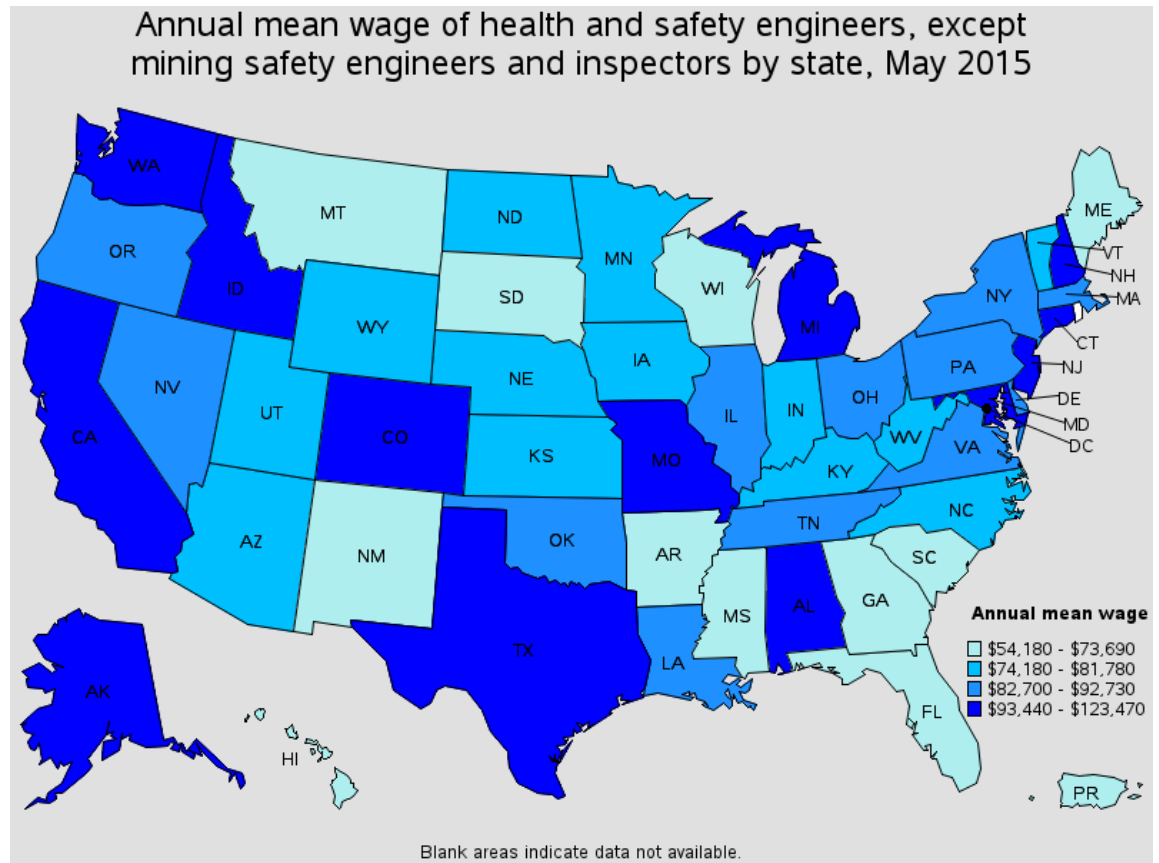
States with the highest employment level in this occupation:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
California	2,880	0.19	1.03	\$47.46	\$98,710
Texas	2,760	0.24	1.32	\$49.54	\$103,040
New York	1,750	0.19	1.08	\$42.85	\$89,130
Georgia	1,320	0.32	1.77	\$35.43	\$73,690
Pennsylvania	990	0.17	0.96	\$40.32	\$83,870



States with the highest concentration of jobs and location quotients in this occupation:

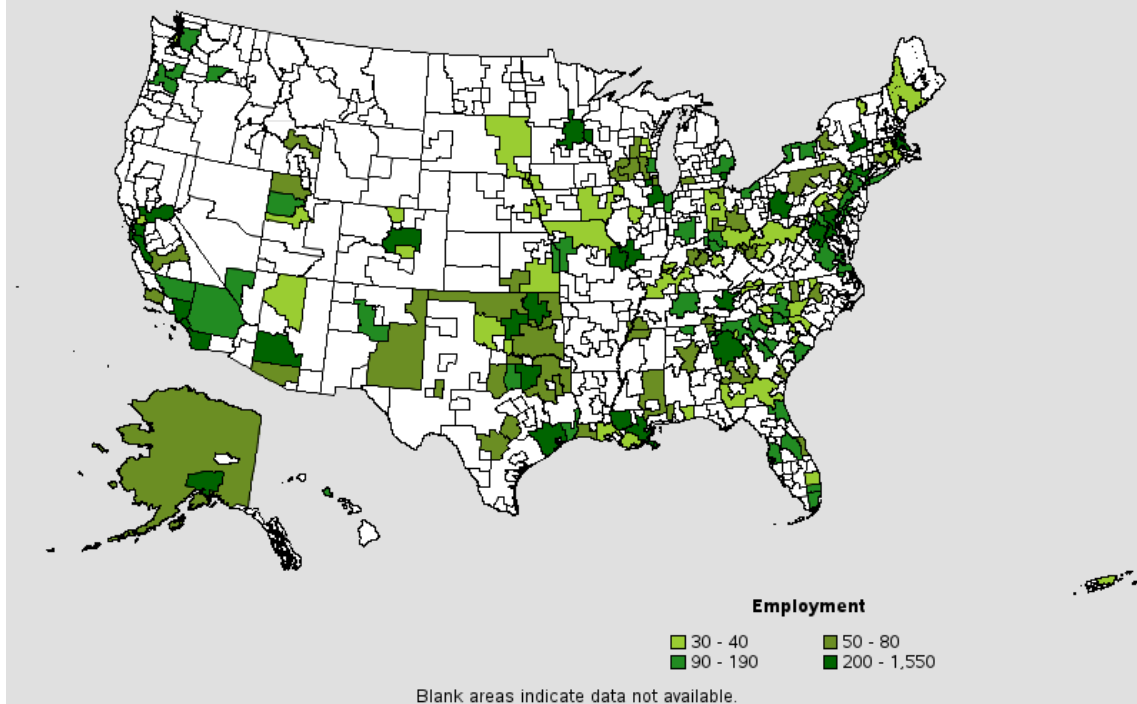
State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Alaska	290	0.89	4.95	\$59.36	\$123,470
Oklahoma	710	0.45	2.47	\$40.85	\$84,960
Louisiana	680	0.35	1.93	\$41.50	\$86,320
Georgia	1,320	0.32	1.77	\$35.43	\$73,690
New Mexico	240	0.30	1.65	\$35.15	\$73,100



Top paying States for this occupation:

State	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Alaska	290	0.89	4.95	\$59.36	\$123,470
Texas	2,760	0.24	1.32	\$49.54	\$103,040
Idaho	110	0.17	0.93	\$47.80	\$99,430
California	2,880	0.19	1.03	\$47.46	\$98,710
District of Columbia	190	0.28	1.54	\$47.06	\$97,890

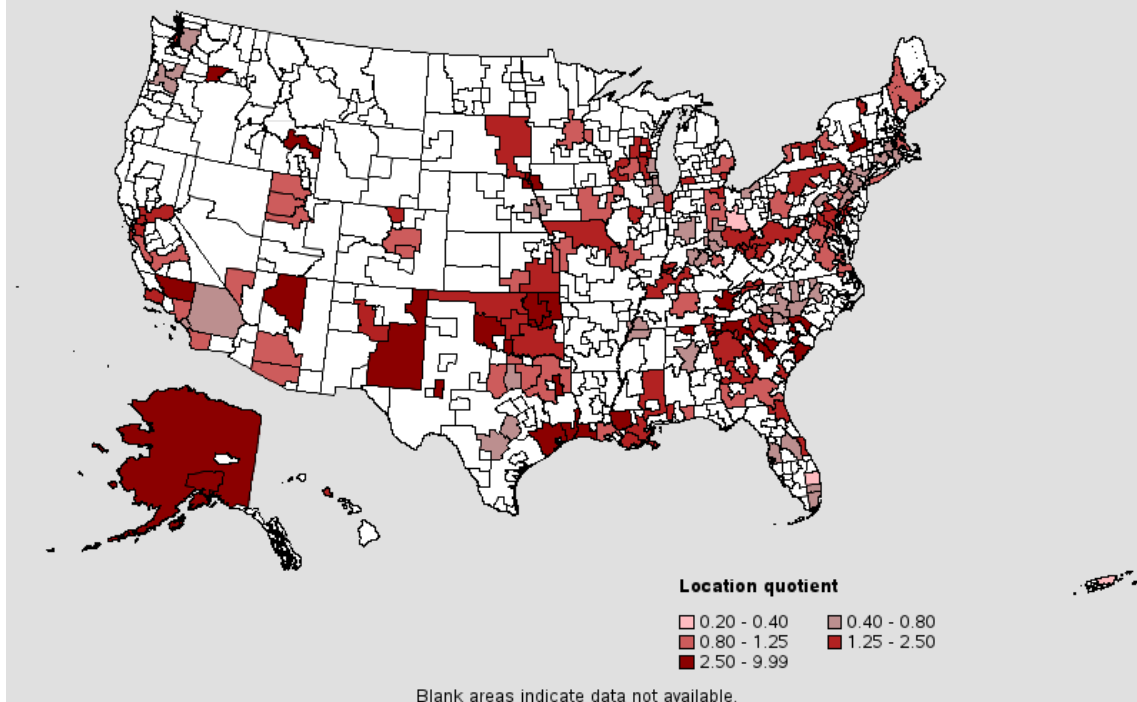
Employment of health and safety engineers, except mining safety engineers and inspectors by area, May 2015



Metropolitan areas with the highest employment level in this occupation:

Metropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Houston-The Woodlands-Sugar Land, TX	1,550	0.53	2.93	\$53.99	\$112,300
New York-Jersey City-White Plains, NY-NJ Metropolitan Division	870	0.13	0.75	\$43.93	\$91,370
Los Angeles-Long Beach-Glendale, CA Metropolitan Division	770	0.19	1.05	\$48.72	\$101,330
Atlanta-Sandy Springs-Roswell, GA	740	0.30	1.65	\$36.13	\$75,140
Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division	450	0.19	1.04	\$49.38	\$102,710
Baltimore-Columbia-Towson, MD	390	0.30	1.64	\$46.04	\$95,760
Minneapolis-St. Paul-Bloomington, MN-WI	380	0.20	1.13	\$38.90	\$80,920
Dallas-Plano-Irving, TX Metropolitan Division	360	0.16	0.86	\$43.01	\$89,460
Chicago-Naperville-Arlington Heights, IL Metropolitan Division	360	0.10	0.56	\$39.08	\$81,280
Boston-Cambridge-Newton, MA NECTA Division	310	0.18	0.98	\$47.13	\$98,040

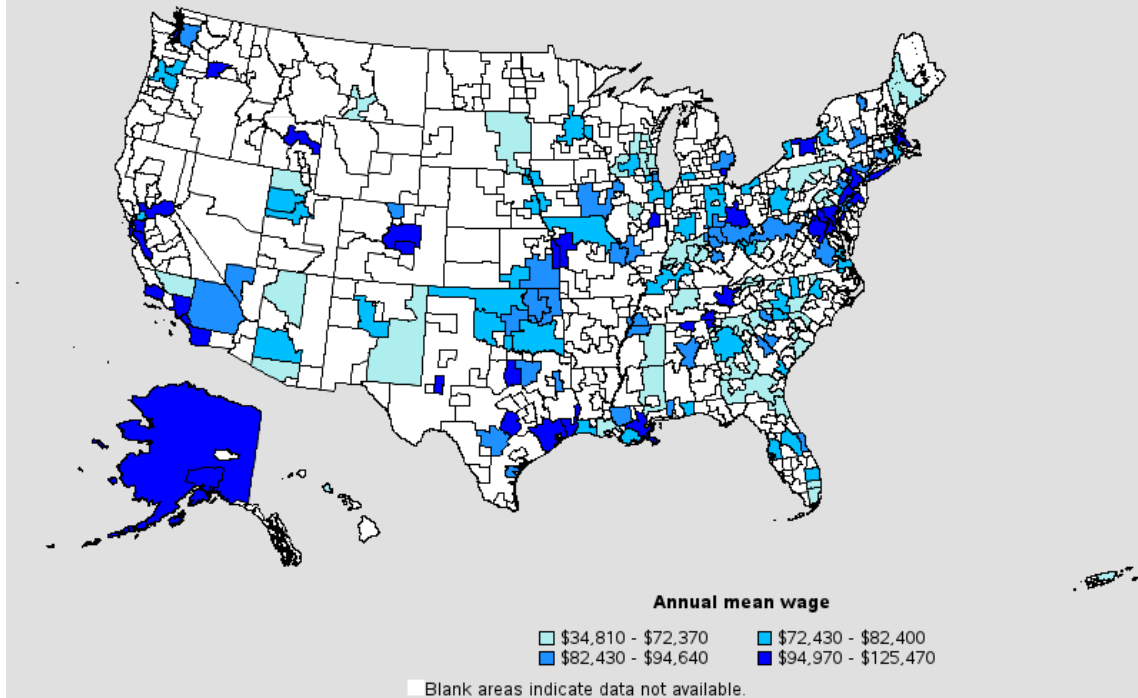
Location quotient of health and safety engineers, except mining safety engineers and inspectors by area, May 2015



Metropolitan areas with the highest concentration of jobs and location quotients in this occupation:

Metropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Kennewick-Richland, WA	190	1.80	9.99	\$50.36	\$104,750
Anchorage, AK	240	1.37	7.61	\$60.32	\$125,470
Idaho Falls, ID	70	1.24	6.84	\$50.25	\$104,520
Augusta-Richmond County, GA-SC	190	0.89	4.92	\$42.23	\$87,830
Huntsville, AL	180	0.84	4.67	\$51.69	\$107,510
Ithaca, NY	40	0.83	4.60	\$29.18	\$60,690
Lake Charles, LA	70	0.77	4.26	\$37.20	\$77,370
Midland, TX	60	0.70	3.85	\$48.36	\$100,590
Fond du Lac, WI	30	0.67	3.70	\$30.49	\$63,420
Bakersfield, CA	190	0.65	3.61	\$32.00	\$66,550

Annual mean wage of health and safety engineers, except mining safety engineers and inspectors by area, May 2015



Top paying metropolitan areas for this occupation:

Metropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Anchorage, AK	240	1.37	7.61	\$60.32	\$125,470
Houston-The Woodlands-Sugar Land, TX	1,550	0.53	2.93	\$53.99	\$112,300
San Jose-Sunnyvale-Santa Clara, CA	200	0.20	1.10	\$53.39	\$111,050
Oakland-Hayward-Berkeley, CA Metropolitan Division	290	0.28	1.52	\$51.69	\$107,510
Huntsville, AL	180	0.84	4.67	\$51.69	\$107,510
Chattanooga, TN-GA	60	0.27	1.49	\$50.94	\$105,950
Kennewick-Richland, WA	190	1.80	9.99	\$50.36	\$104,750
Newark, NJ-PA Metropolitan Division	110	0.10	0.55	\$50.32	\$104,660
Idaho Falls, ID	70	1.24	6.84	\$50.25	\$104,520
Detroit-Dearborn-Livonia, MI Metropolitan Division	270	0.37	2.04	\$50.16	\$104,340

Nonmetropolitan areas with the highest employment in this occupation:

Nonmetropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
North Georgia nonmetropolitan area	90	0.60	3.34	\$30.53	\$63,510
Eastern New Mexico nonmetropolitan area	70	0.50	2.77	\$32.50	\$67,590
Southeast Oklahoma nonmetropolitan area	60	0.38	2.08	\$35.14	\$73,080
Northern Pennsylvania nonmetropolitan area	60	0.37	2.05	\$34.17	\$71,070

South Central Wisconsin nonmetropolitan area	60	0.27	1.48	\$27.52	\$57,240
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Nonmetropolitan areas with the highest concentration of jobs and location quotients in this occupation:

Nonmetropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Pee Dee South Carolina nonmetropolitan area	30	0.67	3.72	\$32.92	\$68,470
Southwest Oklahoma nonmetropolitan area	40	0.65	3.60	\$37.12	\$77,220
Balance of Alaska nonmetropolitan area	50	0.60	3.31	\$54.77	\$113,930
North Georgia nonmetropolitan area	90	0.60	3.34	\$30.53	\$63,510
Eastern New Mexico nonmetropolitan area	70	0.50	2.77	\$32.50	\$67,590

Top paying nonmetropolitan areas for this occupation:

Nonmetropolitan area	Employment (1)	Employment per thousand jobs	Location quotient (9)	Hourly mean wage	Annual mean wage (2)
Balance of Alaska nonmetropolitan area	50	0.60	3.31	\$54.77	\$113,930
Northern West Virginia nonmetropolitan area	40	0.30	1.65	\$44.58	\$92,730
Southern Ohio non-metropolitan area	30	0.23	1.26	\$43.76	\$91,030
Southeast Kansas nonmetropolitan area	30	0.25	1.41	\$41.41	\$86,130
Northeast Oklahoma nonmetropolitan area	50	0.46	2.54	\$40.64	\$84,530

[About May 2015 National, State, Metropolitan, and Nonmetropolitan Area Occupational Employment and Wage Estimates](#)

These estimates are calculated with data collected from employers in all industry sectors, all metropolitan and nonmetropolitan areas, and all states and the District of Columbia. The top employment and wage figures are provided above. The complete list is available in the [downloadable XLS files](#).

The percentile wage estimate is the value of a wage below which a certain percent of workers fall. The median wage is the 50th percentile wage estimate--50 percent of workers earn less than the median and 50 percent of workers earn more than the median. [More about percentile wages](#).

(1) Estimates for detailed occupations do not sum to the totals because the totals include occupations not shown separately. Estimates do not include self-employed workers.

(2) Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where there is not an hourly wage published, the annual wage has been directly calculated from the reported survey data.

(3) The relative standard error (RSE) is a measure of the reliability of a survey statistic. The smaller the relative standard error, the more precise the estimate.

(9) The location quotient is the ratio of the area concentration of occupational employment to the national average concentration. A location quotient greater than one indicates the occupation has a higher share of employment than average, and a location quotient less than one indicates the occupation is less prevalent in the area than average.

Other OES estimates and related information:

[May 2015 National Occupational Employment and Wage Estimates](#)

[May 2015 State Occupational Employment and Wage Estimates](#)

[May 2015 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates](#)

[May 2015 National Industry-Specific Occupational Employment and Wage Estimates](#)

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