

**ROLE DELINEATION STUDY
FOR**

**Safety Trained Supervisor in Construction
and
Safety Trained Supervisor in Mining
Examinations**

**CHEST Technical Report 2009-1
September 2009**



A division of the Board of Certified Safety Professionals

With assistance from

**CASTLE Worldwide, Inc.
Morrisville, North Carolina**

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Role Delineation Study for Safety Trained Supervisor in Construction and Safety Trained Supervisor in Mining Examinations

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PURPOSE AND BACKGROUND

The purpose of this report is to summarize the procedures used to conduct the Safety Trained Supervisor in Construction (STS-Construction) and Safety Trained Supervisor in Mining (STS-Mining) role delineation study and the results obtained from this study. The Council on Certification of Health, Environmental and Safety Technologists (CCHEST), a division of the Board of Certified Safety Professionals, commissioned this role delineation study to update the examination blueprint for the STS-Construction examination and show that the tasks, knowledge and skills associated with STS practice in mining is the same as that in construction. CCHEST uses the examination derived from this process to evaluate the safety- and health-related knowledge and skills of construction and mining supervisors prior to awarding them the STS certification.

Peer-operated certification boards set standards for the practice for which certification is awarded, and evaluate candidates against those standards. Most often, certification boards set three types of standards: education or training, experience, and demonstrated knowledge and skills through examinations.

When testing candidates for a certification, the examination must cover that subject material relevant to the practice for which certification is awarded. This is called content validity. Examinations must be fair for certification candidates. Testing standards published by national peer certification accreditation bodies and the American Psychological Association require content validity to be verified periodically to ensure that certification examinations are current with practice. These standards as well as other psychometric literature also cover appropriate methods and techniques for conducting content validity studies.

CCHEST started the STS certification in 1995. At that time, the only examination path available towards earning the STS certification was the STS-Construction examination. Since then, general industry and petrochemical examination paths have been added. Throughout the lifecycle of this certification, CCHEST has relied on experienced psychometricians and reputable psychometric services firms to provide psychometric services to help ensure the validity of all of the examinations leading to the STS certification.

CCHEST completed the previous role delineation study in 2002. This new study was commissioned in 2008 and completed in 2009. The CCHEST Board of Directors evaluated the results of this study and approved the final examination blueprint at its regular Board meeting in September 2009. Item banks were then updated to prepare for deploying the new edition of the STS-Construction and STS-Mining examination.

The current trend in role delineation studies is to define the roles of the certified population along with the applicable knowledge and skills necessary for carrying out the roles. In conducting this study, CCHEST relied on the psychometric staff of CASTLE Worldwide, Inc. to conduct most of the tasks necessary to complete the study. CCHEST is especially grateful to the practicing supervisors, safety practitioners, and current STS certificants who volunteered their time to serve on the panel of experts and to complete the validations surveys.

METHODOLOGY OVERVIEW

The role delineation study involved three phases. The first phase involved developing and validating the roles performed by STS certificants and supervisors in the construction and mining industries and the knowledge and skills necessary for certificants to perform these roles. The second phase involved validating the information from the first phase using a survey process completed by a representative sample of practitioners in the field of construction and mining supervision. The last phase of the role delineation study was the actual development of the test specification from the ratings obtained from the survey responses acquired in the second phase. Additional details on the methodology used for this study is found in the Annex report by CASTLE Worldwide, Inc.

Phase 1. Initial Development and Validation

CCHEST selected a panel of 13 experts in construction and mining supervisory practice (Annex, Appendix A) to participate in a two-day workshop conducted face-to-face in July 2009. The panel represented a variety of construction and mining practices and geographic regions. A senior psychometrician from CASTLE Worldwide led the workshop. The group defined the major roles (tasks) necessary for competence as a Safety Trained Supervisor in both construction and mining practice.

The group then developed the knowledge and skills certificants need for adequately performing the tasks. Once the knowledge and skills were defined, the panel evaluated each task and rated each task on its importance and criticality as well as the frequency that the task is conducted by certificants. The proposed tasks along with their respective knowledge and skill statements were compiled and used as the basis for the validation surveys sent to the representative sample of existing practitioners.

Phase 2. Validation Study

To conduct this phase, CASTLE Worldwide and CCHEST developed a survey instrument (Annex, Appendix B) to validate the work of the 13-member expert panel convened in Phase 1. The survey first asked several questions relating to the respondents' demographic data to verify that a representative cross-section of the practice was obtained. The survey then asked the respondents to evaluate the task statements proposed by the 13-member expert panel with respect to importance, criticality, and frequency of performance. Finally, the survey asked the respondents to list any tasks that were overlooked.

The survey was sent to 1,843 practitioners, 190 useable responses were returned. The data from the surveys were then used to develop the test specification in Phase 3.

Phase 3. Development of Test Specifications

The final phase of the role delineation study is to develop the specification that will be used for the actual certification examination. Based on the work conducted in Phase 1 and Phase 2, the role delineation study yielded the blueprint and examination specification on the next three pages.

**Safety Trained Supervisor in Construction
Safety Trained Supervisor in Mining**

Examination Blueprint

Task 1 (9.2%): Conduct risk assessments by performing pre-task hazard analyses and evaluating personal protective equipment (PPE), tools, equipment, and job expectations, in order to mitigate hazardous conditions and minimize the risk of incident or injury.

Knowledge Areas:

1. Principles of risk assessment
2. Risk assessment procedures
3. Components of pre-task hazard analyses (e.g., job hazard analysis, job safety analysis, activity hazard analysis, job task analysis)
4. Hazards associated with tasks
5. Available or applicable PPE, tools, and equipment
6. Limitations of PPE, tools, and equipment
7. Proper use, care, and maintenance requirements of PPE, tools, and equipment

Skill Areas:

1. Communicating effectively
2. Developing and conducting pre-task hazard analyses
3. Recognizing hazards and mitigating exposures
4. Using, caring for, and maintaining PPE, tools, and equipment
5. Inspecting for the proper use, care, and maintenance of PPE, tools, and equipment
6. Using testing equipment (e.g., air quality, air velocity, noise)
7. Creating proper documentation

Task 2 (6.9%): Confirm that employees have the necessary job-specific technical skills and qualifications by observing work practices or reviewing training records in order to ensure competent staff.

Knowledge Areas:

1. Work practices and procedures
2. Procedures for observing work practices
3. Training requirements for job tasks
4. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)

Skill Areas:

1. Recognizing desirable and undesirable workplace behavior (e.g., proactive, impaired)
2. Measuring employees' performance through observation
3. Accessing and reading training records
4. Applying applicable standards to the evaluation of employees technical skills

Task 3 (9.2%): Ensure that personnel in the work area are oriented to safety and health considerations by communicating hazardous conditions and monitoring behaviors in order to help ensure that applicable rules and emergency actions plans are understood.

Knowledge Areas:

1. Principles of hazard assessment
2. Components of new hire orientation programs
3. Principles of risk assessment
4. Components of emergency action plans
5. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)
6. Principles of behavior-based safety
7. Characteristics of proactive and reactive safety cultures

Skill Areas:

1. Communicating hazards
2. Conducting new employee orientation
3. Recognizing hazards and mitigating exposures
4. Conducting worksite inspections
5. Conducting safety meetings
6. Coaching safe behavior
7. Comparing safety performance to applicable standards
8. Communicating the emergency action plan

Task 4 (9.2%): Evaluate work practices by observing employees' behavior and their use of PPE, tools, and equipment in order to minimize the risk of incident or injury and to comply with applicable standards.

Knowledge Areas:

1. Work practices and procedures
2. Types of workplace behavior (e.g., proactive, impaired)
3. Available or applicable PPE, tools, and equipment
4. Limitations of PPE, tools, and equipment
5. Proper use, care, and maintenance requirements of PPE, tools, and equipment
6. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)

Skill Areas:

1. Recognizing desirable and undesirable workplace behavior (e.g., proactive, impaired)
2. Measuring employees' performance through observation
3. Defusing emotionally charged situations

**Safety Trained Supervisor in Construction
Safety Trained Supervisor in Mining**

Examination Blueprint (continued)

Task 5 (8.0%): Ensure safety and health standards are implemented through coaching and by correcting observed deficiencies in order to maintain a safe and healthful work environment.

Knowledge Areas:

1. Methods for implementing safety and health rules and regulations
2. Methods for coaching employees
3. Methods for correcting observed deficiencies
4. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)

Skill Areas:

1. Coaching safe behavior
2. Correcting observed deficiencies
3. Applying safety and health standards appropriately

Task 6 (9.2%): Take appropriate action when confronted with unsafe acts and conditions by exercising stop-work authority, modifying tasks, escalating issues to higher management, consulting with qualified professionals (when the matter is outside the scope of the supervisor’s capabilities, etc.) and disciplining employees in order to minimize the risk of incident or injury.

Knowledge Areas:

1. Work practices and procedures
2. Types of workplace behavior (e.g., proactive, impaired)
3. Unsafe acts and conditions
4. Stop-work policies and procedures
5. Modifications of tasks to improve safety
6. Organizational structure and lines of communication
7. Disciplinary action policies and procedures
8. Roles and responsibilities of management and coworkers

Skill Areas:

1. Recognizing unsafe acts and conditions
2. Responding to unsafe acts and conditions
3. Exercising leadership
4. Communicating effectively
5. Documenting unsafe behaviors and conditions, and actions taken in response

Task 7 (8.0%): Facilitate a positive, proactive safety culture by anticipating hazards, modeling and coaching safe behavior, reporting incidents, encouraging employee participation, and communicating performance measures in order to enhance safety and health.

Knowledge Areas:

1. Characteristics of a positive, proactive safety culture
2. Safe work practices and procedures
3. Types of workplace behavior (e.g., proactive, impaired)
4. Methods for modeling and coaching safe behavior
5. Methods for correcting observed deficiencies
6. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)
7. Policies and procedures related to incident reporting

Skill Areas:

1. Recognizing and rewarding safe work practices
2. Correcting observed deficiencies
3. Conducting safety meetings
4. Modeling and coaching safe behavior
5. Applying safety and health standards appropriately

Task 8 (6.9%): Evaluate employees using safety performance and behavior as key criteria in order to hold employees accountable for safety.

Knowledge Areas:

1. Components of employee performance systems
2. Essential behavior to include in performance evaluations (e.g., job safety requirements, attitude toward safety, use of PPE, tools, and equipment)
3. Principles of behavior-based safety
4. Methods for encouraging proactive workplace behavior
5. Methods for holding employees accountable for safe work performance (e.g., positive reinforcement, negative reinforcement)

Skill Areas:

1. Making objective observations
2. Comparing safety performance to applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)
3. Providing feedback on safe work performance
4. Communicating proactively
5. Listening to suggestions
6. Tasking disciplinary actions

**Safety Trained Supervisor in Construction
Safety Trained Supervisor in Mining**

Examination Blueprint (continued)

Task 9 (6.9%): Participate in investigations that determine causes, identify corrective actions, document lessons learned, and address employee concerns using recognized investigation techniques in order to minimize the risk of workplace incidents.

Knowledge Areas:

1. Work practices and procedures
2. Types of workplace behavior (e.g., proactive, impaired)
3. Available or applicable PPE, tools, and equipment
4. Limitations of PPE, tools, and equipment
5. Proper use, care, and maintenance requirements of PPE, tools, and equipment
6. Principles of incident investigation and root cause analysis
7. Roles and responsibilities of various personnel involved with investigations
8. Communication requirements related to investigations at all organizations levels (e.g., crisis management, company policy)
9. Development and uses of lessons learned

Skill Areas:

1. Conducting incident investigations
2. Identifying corrective actions
3. Identifying root causes
4. Accessing and documenting lessons learned
5. Addressing employees' concerns
6. Communicating effectively

Task 10 (5.7%): Verify the effectiveness of emergency action plans through training and practice in order to ensure effective response in crises.

Knowledge Areas:

1. Principles of emergency action planning
2. Components of emergency action plans
3. Training techniques and exercises (e.g., simulation, drill)
4. Crisis management techniques that include first response protocols

Skill Areas:

1. Communicating the emergency action plan
2. Conducting emergency action drills
3. Conducting training related to emergency action plans and crisis management plans
4. Preparing after-action reports that include lessons learned

Task 11 (6.9%): Coordinate operations and work processes with other supervisors by communicating effectively in order to minimize risk.

Knowledge Areas:

1. Roles and responsibilities of other management personnel
2. Work practices and procedures
3. Available or applicable PPE, tools, and equipment
4. Communication strategies and requirements
5. Crew coordination techniques (e.g., between shift changes, upon recognizing adjacent area hazards)
6. Inspection and documentation procedures
7. Hazards related to work processes

Skill Areas:

1. Communicating effectively
2. Using standard terminology
3. Recognizing hazards and mitigating exposures
4. Minimizing exposures through risk assessment
5. Recording shift events

Task 12 (9.2%): Perform safety and health-related record keeping in accordance with applicable standards using established procedures in order to document essential processes.

Knowledge Areas:

1. Events that require documentation (e.g., task analysis, safety meetings, on-the-job training, inspections, incident investigations)
2. Safety and health record keeping systems
3. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)
4. Confidentiality requirements

Skill Areas:

1. Writing clearly and effectively
2. Using established documentation procedures and forms
3. Maintaining confidentiality of records

Task 13 (4.6%): Comply with company and STS codes of ethics by resolving issues consistently with these requirements in order to protect the interests of employees, employers, and other stakeholders.

Knowledge Areas:

1. Components of company and STS codes of ethics

Skill Areas:

1. Resolving issues ethically
2. Communicating effectively

CONCLUSIONS

1. There was consensus among the panelists that the tasks associated with STS practice in construction and mining, and knowledge and skills needed to carry out these tasks, are substantially equivalent between mining and construction. There was much discussion and much agreement that the work associated with STS certificants varies only in regulatory framework, not in the basic principles, practices, and knowledge and skills. The validation survey confirms this hypothesis. Therefore, the same examination blueprint shall be used for both the STS-Construction and the STS-Mining examinations. This implies that an identical examination instrument may be used to examine STS applicants in construction and in mining.
2. The 13 task areas in this blueprint were similar to the task areas in the current STS-General Industry and STS-Petrochemical examination blueprints. This implies that the roles of STS certificants are also similar among other industries, not just mining and construction.
3. Analysis of the knowledge areas developed for each task support the use of a written, multiple-choice examination instrument based on practical considerations, such as cost, objectivity in scoring and the types of knowledge and skills included in the study results.

ANNEX

CASTLE WORLDWIDE ROLE DELINEATION STUDY

*Council on Certification of Health, Environmental, and
Safety Technologists
(CCHEST)*



**Role Delineation Study
of
Safety Trained Supervisors in
Construction and Mining**

August 2009

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Introduction

In July 2009, a panel of 13 experts assembled by the Council on Certification of Health, Environmental, and Safety Technologists (CCHHEST) met with representatives from CASTLE Worldwide, Inc. to delineate the field of the Safety Trained Supervisors in Construction and Mining (STS-Construction, STS-Mining).

The CCHHEST credentialing program ensures competency and professionalism in the field of safety trained supervisors in construction and mining by requiring that the Safety Trained Supervisor in Construction and Mining meets specific criteria designed to ensure competency in the provision of services.

The development of a quality credentialing or licensing program must follow certain logically sound and legally defensible procedures for developing examinations. These principles and procedures are outlined in federal regulation (Uniform Guidelines on Employee Selection Procedures) and manuals, such as Standards for Educational and Psychological Testing (published by the American Educational Research Association, 1999). CASTLE adheres to these standards in developing examinations for credentialing programs, including the Safety Trained Supervisor in Construction and Mining certification program.

Before a content-valid examination is developed, the knowledge and skills necessary for competent practice in the profession must be determined. The process for identifying these competency areas is a role delineation, or job analysis, which serves as a blueprint for examination development. Role delineation also helps to determine the type of examination, such as written or practical, to be developed in order to assess competence.

The primary reason for conducting a role delineation study is to ensure that an examination is content-valid. Content validity is the most commonly applied and accepted validation strategy used in establishing certification programs today. In psychometric terms, validation is the way a test developer documents that the competence to be inferred from a test score is actually measured by the examination. A content-valid examination, then, appropriately evaluates knowledge or skills required to function as a competent practitioner in the field.

Thus, the role delineation study is an integral part of ensuring that an examination is content-valid—that the aspects of the profession covered on the examination reflect the tasks performed in practice settings. In addition, the study identifies the importance, criticality, and frequency of each of the performance tasks. These ratings play an important role in determining the content of the examination.

The role delineation study for the CCHHEST consisted of the following three phases, which are the focus of this report:

- I. Initial Development and Validation. The role delineation panel identified the tasks, knowledge, and skills essential to the performance of a Safety Trained Supervisor in Construction and Mining.
- II. Validation Study. A representative sample of professionals in the field of safety professionals reviewed and validated the work of the role delineation panel.
- III. Development of Test Specifications. Based on the ratings gathered from the representative sample of safety trained supervisors in construction and mining, the test specifications for the certification examination were developed.

PHASE I:

INITIAL DEVELOPMENT AND EVALUATION

The first step in analyzing the profession of the Safety Trained Supervisor in Construction and Mining was to establish the minimum eligibility criterion for taking the examination. STS certification establishes a minimum competency in general safety practices. To achieve the certification, candidates must meet minimum safety training and work experience requirements and demonstrate knowledge of safety fundamentals and standards by examination. Those holding the STS-Construction or STS-Mining certification must renew it annually and meet recertification requirements every five years.

To gain eligibility for a Safety Trained Supervisor examination, applicants must be of good moral character and meet the following three requirements:

1. Have two years of experience in any industry or in the industry related to the version of the STS examination to be taken.
2. Have one year of experience as a supervisor or safety leader of a work group. Examples are manager, foreman, crew chief, superintendent, or member of a safety committee. This experience can be concurrent with Requirement #1. If individuals are training to become a supervisor or safety leader and do not have the one year of experience in such roles, two additional years of industry experience can be substituted in Requirement #1.
3. Have completed 30 hours of formal safety training through a single course or multiple training courses.

To achieve the STS certification, candidates must pass a Safety Trained Supervisor examination.

The next steps in analyzing the profession of the Safety Trained Supervisor in Construction and Mining were the identification of the performance tasks and the identification of the knowledge and skills associated with each task.

In July 2009, the CCHESST assembled a 13-member panel of subject matter experts in the Safety Trained Supervisor in Construction and Mining field to discuss the role of the Safety Trained Supervisor in Construction and Mining. The panel members represented a variety of practice settings and geographic regions. A complete listing of panel members is provided in Appendix A. The following steps were undertaken to complete Phase I:

A. The panel determined that the profession could be divided into 13 major content areas¹ (or performance tasks). These tasks are as follow.

TASK NUMBER	TASK DESCRIPTION
1	Conduct risk assessments by performing pre-task hazard analyses and evaluating PPE, tools, equipment, and job expectations in order to mitigate potential hazards and minimize the risk of incident or injury.
2	Confirm that employees have the necessary job-specific technical skills and qualifications by observing work practices and/or reviewing training records in order to ensure competent staff.
3	Ensure that personnel in the work area are oriented to safety and health considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.
4	Evaluate work practices by observing employees' behavior and their use of PPE, tools, and equipment in order to minimize the risk of incident or injury and comply with applicable standards.
5	Ensure safety and health standards are implemented through coaching and by correcting observed deficiencies in order to maintain a safe and healthful work environment.
6	Take appropriate action when confronted with unsafe acts and conditions by exercising stop-work authority, modifying tasks, escalating issues to higher management, consulting with qualified professionals (when the matter is outside the scope of the supervisor's capabilities, etc.), and disciplining employees in order to minimize the risk of incident or injury.
7	Facilitate a positive, pro-active safety culture by anticipating hazards, modeling and coaching safe behavior, reporting incidents, encouraging employee participation, and communicating performance measures in order to enhance safety and health.
8	Evaluate employees using safety performance and behavior as key criteria in order to hold employees accountable for safety.
9	Participate in investigations that determine causes, identify corrective actions, document lessons learned, and address employee concerns using recognized investigation techniques in order to minimize the risk of workplace incidents.
10	Verify the effectiveness of emergency action plans through training and practice in order to ensure effective response in crises.
11	Coordinate operations and work processes with other supervisors by communicating effectively in order to minimize risk.
12	Perform safety and health-related record keeping in accordance with applicable standards using established procedures in order to document essential processes.
13	Comply with company and STS codes of ethics by resolving issues consistently with these requirements in order to protect the interests of employees, employers, and other stakeholders.

¹ The panel did not identify any performance domains to provide an over-arching organization of the performance tasks.

- B. The panel subsequently generated a list of knowledge and skills required to perform each performance task.
- C. The panel members then evaluated each performance task, rating each on importance and criticality to the Safety Trained Supervisor in Construction and Mining professional and the frequency with which the activities associated with each task are performed.

Based on the work of the role delineation panel, an electronic survey was developed and distributed to professionals in the field of Safety Trained Supervisor in Construction and Mining. The results of the survey are the focus of Phase II.

**PHASE II:
VALIDATION STUDY**

I. Questionnaire Design and Distribution

Using the performance tasks identified by the role delineation panel, CASTLE Worldwide, Inc., developed a questionnaire to be completed by a sample of Safety Trained Supervisor in Construction and Mining professionals or other professionals with equal or greater expertise. CASTLE distributed the questionnaire to the professionals to evaluate, validate, and provide feedback on the role delineation panel's performance tasks. The questionnaire also solicited biographical information from the respondents to ensure a representative response and completion by appropriately qualified individuals. The load file used to create the online survey is presented in Appendix B.

Of the 1,843 questionnaires distributed, 190 usable responses were submitted to CASTLE. However, not all individuals responded to every question. For this reason, the total number of responses per question varies slightly.

II. Characteristics of the Sample

The following tables provide the demographic breakdown of the survey respondents. Survey respondents were asked to provide information on 15 different demographic variables.

Table 1. What is your gender?

The respondents were overwhelmingly male.

What is your gender?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	16	8.4	8.5	8.5
	Male	172	90.5	91.5	100.0
	Total	188	98.9	100.0	
Missing	System	2	1.1		
Total		190	100.0		

Table 2. What is your age?

The largest group of respondents reported an age between 40 and 49 years.

		What is your age?			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 20 years	9	4.7	4.8	4.8
	20-29 years	34	17.9	18.1	22.9
	30-39 years	57	30.0	30.3	53.2
	40-49 years	71	37.4	37.8	91.0
	50-60 years	17	8.9	9.0	100.0
	Total	188	98.9	100.0	
Missing	System	2	1.1		
Total		190	100.0		

Table 3. In which state or province do you live?

California was the most represented state. Washington and Colorado placed second and third, respectively.

		In which state or province do you live?			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	AK	5	2.6	2.6	2.6
	AL	3	1.6	1.6	4.2
	AP	2	1.1	1.1	5.3
	CA	25	13.2	13.2	18.4
	CO	17	8.9	8.9	27.4
	CT	1	.5	.5	27.9
	FL	4	2.1	2.1	30.0
	GU	4	2.1	2.1	32.1
	HI	11	5.8	5.8	37.9
	ID	6	3.2	3.2	41.1
	IL	5	2.6	2.6	43.7
	IN	1	.5	.5	44.2

KY	2	1.1	1.1	45.3
LA	6	3.2	3.2	48.4
MD	6	3.2	3.2	51.6
MI	4	2.1	2.1	53.7
MO	2	1.1	1.1	54.7
NC	6	3.2	3.2	57.9
NE	1	.5	.5	58.4
NJ	3	1.6	1.6	60.0
NM	2	1.1	1.1	61.1
NV	1	.5	.5	61.6
NY	3	1.6	1.6	63.2
OH	8	4.2	4.2	67.4
OK	1	.5	.5	67.9
Not given	9	4.7	4.7	72.6
OR	1	.5	.5	73.2
PA	5	2.6	2.6	75.8
PR	1	.5	.5	76.3
SC	3	1.6	1.6	77.9
TN	5	2.6	2.6	80.5
TX	9	4.7	4.7	85.3
VA	5	2.6	2.6	87.9
WA	19	10.0	10.0	97.9
WI	3	1.6	1.6	99.5
WV	1	.5	.5	100.0
Total	190	100.0	100.0	

Table 4. What is the name of your current employer?

A wide variety of companies was represented. However, URS was most commonly reported.

Current Employer				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Acadian Ambulance Services	1	.5	.5	.5
Ajax Paving Industries, Inc.	2	1.1	1.1	1.6
Alaska Clean Seas	1	.5	.5	2.1
Allied Project Management	1	.5	.5	2.6
Aloha Petroleum	1	.5	.5	3.2
American Piping & Boiler Co.	1	.5	.5	3.7
AREVA, NP	1	.5	.5	4.2
Atlantic Plant Maintenance	2	1.1	1.1	5.3
Bechtel Construction	3	1.6	1.6	6.8
Black Construction Corporation	1	.5	.5	7.4
Bloomsdale Excavating	1	.5	.5	7.9
Burns & Roe / DCK North America	2	1.1	1.1	8.9
C.J. Mahan Construction	2	1.1	1.1	10.0
CDM Constructors Inc.	1	.5	.5	10.5
CH2M Hill	9	4.7	4.7	15.3
Clark Construction, LLC	8	4.2	4.2	19.5
Comer Construction, Inc.	1	.5	.5	20.0
Concrete Services	1	.5	.5	20.5
Contri Construction	1	.5	.5	21.1
DCK WW Pacific Guam	2	1.1	1.1	22.1
Eberline Services Hanford Inc.	3	1.6	1.6	23.7
ECC	1	.5	.5	24.2
Ferguson Electric	2	1.1	1.1	25.3
Flatiron West, Inc.	1	.5	.5	25.8
Granite	1	.5	.5	26.3
Harper Construction	1	.5	.5	26.8
Haztek Inc.	1	.5	.5	27.4

HDR Construction Control Corp.	1	.5	.5	27.9
HGS Engineering Inc.	1	.5	.5	28.4
HMH Builders Inc.	3	1.6	1.6	30.0
Industrial safety Solutions	1	.5	.5	30.5
Kiewit Energy Co.	1	.5	.5	31.1
LYZ, Inc.	1	.5	.5	31.6
Med-Tex Services Inc.	2	1.1	1.1	32.6
Nan, Inc	1	.5	.5	33.2
NIPPO Corporation	1	.5	.5	33.7
Nova Group Inc.	3	1.6	1.6	35.3
Omitted	4	2.1	2.1	37.4
Osborne Construction	1	.5	.5	37.9
Par Electrical Contractors, Inc.	1	.5	.5	38.4
Reliable Builders Inc.	1	.5	.5	38.9
RQ Construction, Inc.	2	1.1	1.1	40.0
Rust Constructors Puerto Rico, Inc.	1	.5	.5	40.5
Safety and Training Consultants, Inc.	1	.5	.5	41.1
SCMC	1	.5	.5	41.6
Shaw Group	1	.5	.5	42.1
SM Stoller Corp.	7	3.7	3.7	45.8
Smoky Mountain Risk Management	1	.5	.5	46.3
Soltek Pacific Construction	1	.5	.5	46.8
Sturgeon Electric Co. Inc	1	.5	.5	47.4
Swinerton Builders	6	3.2	3.2	50.5
Swinerton Builders Of Hawaii	1	.5	.5	51.1
Tesoro Corporation	2	1.1	1.1	52.1
The Clark Construction Group	1	.5	.5	52.6
The Korte Company	1	.5	.5	53.2
The Shaw Group, inc.	1	.5	.5	53.7
TolTest Inc	1	.5	.5	54.2
URS Canadian Operations Limited	2	1.1	1.1	55.3
URS Corporation	15	7.9	7.9	63.2

URS Washington Division	49	25.8	25.8	88.9
US Army Corps Of Engineers	1	.5	.5	89.5
Washington Closure Hanford	10	5.3	5.3	94.7
Washington Group	1	.5	.5	95.3
Washington Group INT'L	1	.5	.5	95.8
Washington Tru Solutions, LLC	1	.5	.5	96.3
Watts Constructors	3	1.6	1.6	97.9
Weitz Company	1	.5	.5	98.4
William P. Young Construction, Inc	1	.5	.5	98.9
Williams	1	.5	.5	99.5
Wisconsin Energy Corp	1	.5	.5	100.0
Total	190	100.0	100.0	

Table 5. In what industry would your current employer be categorized?

Building construction—general contractor was the most frequently reported industry category. However, nearly a third of the respondents listed categories not on the formal list. These additional categories are presented in Appendix C.

In what industry would your current employer be categorized?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Building construction—general contractor	61	32.1	46.9	46.9
	Construction—other than building construction or general contractor	44	23.2	33.8	80.8
	Construction—special trades	17	8.9	13.1	93.8
	Surface mining	8	4.2	6.2	100.0
	Total	130	68.4	100.0	
Missing System		60	31.6		
Total		190	100.0		

Table 6. What is your current position?

Of the listed positions, the most commonly reported was superintendent. However, nearly two-thirds of the respondents indicated holding some other position. The descriptions of the “other” positions were not collected in the survey. In addition, no respondent indicated being retired.

		What is your current position?			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Foreman	10	5.3	5.4	5.4
	Superintendent	49	25.8	26.3	31.7
	Crew chief	2	1.1	1.1	32.8
	Retired	0	0.0	0.0	32.8
	Other	125	65.8	67.2	100.0
	Total	186	97.9	100.0	
Missing	System	4	2.1		
Total		190	100.0		

Table 7. How many years have you worked as a foreman, supervisor, superintendent, or crew chief?

Over 25% of the respondents indicated having 25 years or more of experience.

How many years have you worked as a foreman, supervisor, superintendent, or crew chief?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fewer than 3 years	12	6.3	6.4	6.4
	3 to 5 years	29	15.3	15.4	21.8
	6 to 10 years	36	18.9	19.1	41.0
	11 to 15 years	31	16.3	16.5	57.4
	16 to 20 years	27	14.2	14.4	71.8
	More than 20 years	53	27.9	28.2	100.0
	Total	188	98.9	100.0	
Missing	System	2	1.1		
Total		190	100.0		

Table 8. How many employees work at your facility?

Nearly two-thirds of the respondents indicated working in a facility with over 100 employees.

How many employees work at your facility?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 to 10 employees	7	3.7	3.7	3.7
	11 to 25 employees	14	7.4	7.4	11.2
	26 to 50 employees	18	9.5	9.6	20.7
	51 to 75 employees	9	4.7	4.8	25.5
	76 to 100 employees	15	7.9	8.0	33.5
	More than 100 employees	125	65.8	66.5	100.0
	Total	188	98.9	100.0	
Missing System		2	1.1		
Total		190	100.0		

Table 9. How many employees do you supervise?

Almost a third of the respondents indicated supervising 1 to 10 employees.

How many employees do you supervise?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	37	19.5	19.7	19.7
	1 to 10 employees	57	30.0	30.3	50.0
	11 to 25 employees	29	15.3	15.4	65.4
	26 to 50 employees	23	12.1	12.2	77.7
	51 to 75 employees	11	5.8	5.9	83.5
	More than 75 employees	31	16.3	16.5	100.0
	Total	188	98.9	100.0	
Missing	System	2	1.1		
Total		190	100.0		

Table 10. How many hours of formal safety and health-related training have you received, excluding formal academic coursework?

Almost half of the respondents indicated receiving more than 150 hours of formal safety and health-related training.

How many hours of formal safety and health-related training have you received, excluding formal academic coursework?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 to 29 hours	4	2.1	2.1	2.1
	30 to 49 hours	30	15.8	16.0	18.1
	50 to 99 hours	30	15.8	16.0	34.0
	100 to 150 hours	34	17.9	18.1	52.1
	More than 150 hours	90	47.4	47.9	100.0
	Total	188	98.9	100.0	
Missing	System	2	1.1		
Total		190	100.0		

Table 11. In what industry would your previous employer be categorized?

Almost three-quarters of the respondents indicated their previous employer could be categorized in construction. Ten respondents indicated being in both construction and mining at their last place of employment. Many respondents indicated alternative categories to those provided. Those alternative categories are presented in Appendix D.

Industry	Count	Percent
Construction	137	72.1
Mining	14	7.4
Construction and Mining	10	5.3
Total	161	

Table 12. What is your highest level of education?

A few over a third of the respondents indicated holding a Bachelor’s degree, whereas almost a third indicated having some college courses.

What is your highest level of education?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Some high school	1	.5	.5	.5
	High school diploma (GED)	23	12.1	12.2	12.7
	Some college courses	61	32.1	32.3	45.0
	Associate degree	19	10.0	10.1	55.0
	Bachelor’s degree	64	33.7	33.9	88.9
	Master’s degree	20	10.5	10.6	99.5
	Doctoral degree	1	.5	.5	100.0
	Total	189	99.5	100.0	
Missing	System	1	.5		
Total		190	100.0		

Table 13. Which of the following credentials do you hold?

STS was by far the most commonly held credential by the survey respondents.

Which of the following credentials do you hold?		
Credential	Count	Percent
CHMM	1	0.5
CHST	26	13.8
CIH	1	0.5
CSP	5	2.6
STS	170	89.5
OHST	2	1.1
PE	14	7.4
Total	219	

The count adds to more than 190 and the percent to more than 100 because respondents can hold multiple credentials.

The respondents also indicated holding other credentials. Those credentials are as follow.

Other Credentials Held
Certified OSHA Trainer/Certified FEMA/DHS IS860 NIPP
CET, CIT, STS
CET, REA, CESCL
CHST
CSST
CSST
EIT
EMT-P, COSS
LEED AP
LEED AP
Licensed Architect
NRRPT
NRRPT
OSHA 30
PMP
PMP
PMP Certification
Professional Geologist
Professional Land Surveyor (PLS)
Project Management Professional (PMP)
Provincial Open Pit Supervisor Certification, Blasting License, Surface Mine Rescue
Registered Sanitarian
RSP- Registered Safety professional
Several in HazMat and DOT and Safety
STS, NREMT-P
Surface Coal Mine Blasting License

III. Evaluation of Performance Tasks

A. Survey Respondents' Evaluations

The survey respondents were asked to evaluate each performance task, rating each on importance, criticality, and frequency. A 5-point scale (0 to 4) was used for the importance, criticality, and frequency ratings, with a "4" representing the highest rating. The scale anchors are listed below as a reference.

Importance Ratings

Participants were asked to rate each performance task on a rating of importance, the degree to which knowledge of the task is essential to the job performance of a minimally competent safety trained supervisor. A deficiency of knowledge would likely cause harm (of some type) to the profession or professional. The rating anchors are provided below.

- 0 = Of No Importance. This performance task is of no importance to the job performance of the competent safety professional.
- 1 = Of Little Importance. This performance task is of little importance to the job performance of the competent safety professional.
- 2 = Moderately Important. This performance task is moderately essential to the job performance of the competent safety professional.
- 3 = Very Important. This performance task is clearly essential to the job performance of the competent safety professional.
- 4 = Extremely Important. This performance task is absolutely essential to the job performance of the competent safety professional.

As presented in Table 14, survey respondents indicated that the sixth task was the most important of the 13.

Table 14. Ratings of Importance for the performance tasks.

Task	Survey	Panel	Difference
1	3.60	3.77	0.17
2	3.28	3.54	0.26
3	3.52	3.46	0.06
4	3.37	3.69	0.32
5	3.30	3.38	0.09
6	3.70	3.62	0.08
7	3.38	3.46	0.08
8	3.18	2.54	0.65
9	3.28	3.08	0.20
10	3.16	3.46	0.30
11	3.22	2.85	0.37
12	3.44	3.62	0.18
13	3.30	3.15	0.15

Criticality Ratings

Participants were asked to rate each task on a rating of criticality, or the degree to which adverse effects could result if the certified safety trained supervisor is not knowledgeable in the task. The rating anchors are provided below.

- 0 = No Harm. Inability to perform this task would lead to error with no adverse consequences.
- 1 = Minimal Harm. Inability to perform this task would lead to error with minimal adverse consequences.
- 2 = Moderate Harm. Inability to perform this task would lead to error with moderate adverse consequences.
- 3 = Substantial Harm. Inability to perform this task would lead to error with substantial adverse consequences.
- 4 = Extreme Harm. Inability to perform this task would definitely lead to error with severe adverse consequences.

Table 15. Criticality of the performance tasks

The survey respondents thought the sixth task was most critical. The criticality ratings of the tasks differed more between the survey and the panel than did the importance and frequency ratings.

Task	Survey	Panel	Difference
1	3.02	3.54	0.52
2	2.79	3.46	0.68
3	3.02	3.38	0.37
4	2.94	3.54	0.60
5	2.71	3.00	0.29
6	3.31	3.46	0.15
7	2.52	3.31	0.79
8	2.36	1.15	1.20
9	2.47	3.00	0.53
10	2.70	3.00	0.30
11	2.76	3.00	0.24
12	2.78	3.08	0.30
13	2.53	2.15	0.38

Frequency Ratings

The frequency of the performance tasks refers to the time that the competent certified safety trained supervisor spends performing duties within the task. Respondents were asked to estimate the amount of time spent performing duties associated with the domain by selecting the number of the description below that best exemplifies the rating for each task.

- 0 =** Never. The competent safety professional never performs the tasks within this performance task.
- 1 =** Rarely. The competent safety professional rarely performs the tasks within this performance task.
- 2 =** Sometimes. The competent safety professional sometimes performs the tasks within this performance task.
- 3 =** Often. The competent safety professional often performs the tasks within this performance task.
- 4 =** Repetitively. The competent safety professional repetitively performs the tasks within this performance task.

Table 16. Frequency ratings of the performance tasks.

The survey respondents gave the first performance the highest mean frequency rating.

Task	Survey	Panel	Difference
1	3.54	3.77	0.23
2	3.06	3.62	0.55
3	3.46	3.23	0.23
4	3.67	2.92	0.75
5	3.50	3.38	0.12
6	3.32	2.92	0.40
7	3.39	3.15	0.24
8	2.84	2.46	0.38
9	2.50	3.08	0.58
10	2.21	2.85	0.64
11	2.72	2.31	0.41
12	3.40	3.62	0.22
13	3.12	3.08	0.04

B. Estimates of Risk

The ratings of importance, criticality, and frequency were combined to for an estimate of risk, where risk is defined as the sum of importance and criticality multiplied by frequency (i.e., $R = [I+C]*F$).

Table 17. Estimates of Risk for the performance tasks

The survey respondents gave the twelfth performance task the ratings that produced the greatest value of risk.

Task	Survey	Panel	Difference
1	23.74	27.85	4.11
2	18.87	25.62	6.74
3	22.75	22.38	0.37
4	23.06	21.46	1.60
5	21.01	21.77	0.76
6	23.29	21.46	1.83
7	19.99	22.00	2.01
8	16.16	9.69	6.47
9	14.77	19.85	5.08
10	13.28	19.38	6.11
11	17.27	14.00	3.27
12	24.55	24.69	0.14
13	19.94	17.92	2.02

The values of risk will be used to estimate the examination blueprint.

IV. Reliability Analysis of Performance Domain Scales

The reliability of the scales was assessed in order to determine how consistently the sub-domains measured the performance domain of interest. Reliability refers to the degree to which tests or surveys are free from measurement error. Consider a scale that registered a substantially different weight with each use for the same person. With this inconsistency (i.e., unreliability), it would be impossible to determine an accurate weight. This analogy can be extended to the Importance, Criticality, and Frequency ratings of each performance domain. It is important to understand the consistency of the data along these dimensions in order to draw defensible conclusions.

Reliability was measured by internal consistency (Cronbach's Alpha) using the respondent's ratings of Importance, Criticality, and Frequency for each performance domain. This calculates the extent to which each sub-domain rating within each performance domain consistently measures what other sub-domains within that performance domain measure. Reliability coefficients range from 0 to 1 and should be above .7 to be judged as adequate. Reliability values below .7 indicate an unacceptable amount of measurement error.

The reliability of the ratings of importance, criticality, and frequency were .881, .921, and .870, respectively, which are all sufficiently high for use in this study. The overall reliability of the ratings was .917, which indicates that the estimates of risk are sufficiently reliable to use with the estimation of the examination blueprint.

V. Summary of Results

As shown in the tables on the preceding pages, the survey respondents indicated that all performance domains are important. Each of the three performance tasks has an average importance of at least 3.16 on the 5-point rating scale. A rating of three indicates Very Important.

Similarly, the respondents considered all the performance tasks to be at least moderately critical. Each of the three performance tasks has an average criticality rating of at least 2.36 on the 5-point scale, which means that incompetent performance of each task could result in moderate or greater harm (of some type) to the public.

The survey respondents indicated the tasks were performed at least at the "sometimes" level. The lowest mean rating of frequency was 2.21 for task 10.

VI. Conclusion

The results of the survey validate the results of the role delineation panel. This conclusion means that the performance tasks, knowledge, and skills developed by the role delineation panel constitute an accurate definition of the work of a certified safety trained supervisor in construction and mining. In addition, no difference was uncovered between the ratings from construction and mining safety trained supervisors, indicating that examination blueprints for construction and mining safety trained supervisors are equivalent.

Based on an analysis of the sub-domains, knowledge, and skills identified by the role delineation study, competence in the profession can be assessed using a single examination format.

PHASE III:

TEST SPECIFICATIONS

The final phase of a role delineation study is the development of test specifications, which identify the proportion of questions for each performance task that will appear on the certification examination. Test specifications are developed by combining the overall evaluations of importance, criticality, and frequency and converting the results into percentages. These percentages are used to determine the number of questions related to each performance task that should appear on the examination.

Note: This examination contains 87 scored items and 13 experimental (unscored) items.

Task	Risk	Weight	Items
1	23.74	0.09	8
2	18.87	0.07	6
3	22.75	0.09	8
4	23.06	0.09	8
5	21.01	0.08	7
6	23.29	0.09	8
7	19.99	0.08	7
8	16.16	0.06	5
9	14.77	0.06	5
10	13.28	0.05	4
11	17.27	0.07	6
12	24.55	0.09	8
13	19.94	0.08	7
Total	258.68	1.00	87

After review, the CCHST board decided to align the weighting of the “ethics” task (i.e., #13) with the related exams, CHST and OHST, to retain content consistency. To produce this consistency, the number of items for Task 13 was reduced to four, and the remaining three items were distributed equally to tasks 8, 9, and 10. The resulting blueprint follows.

Task	Items
1	8
2	6
3	8
4	8
5	7
6	8
7	7
8	6
9	6
10	5
11	6
12	8
13	5
Total	87

The assessment instrument blueprint and specifications are valid for both construction and mining safety trained supervisor practice.

DOMAINS, SUB-DOMAINS, AND KNOWLEDGE AND SKILL STATEMENTS

This section of the report contains the tasks and knowledge and skill statements as delineated by the role delineation panel.

COUNCIL ON CERTIFICATION OF HEALTH, ENVIRONMENTAL AND SAFETY TECHNOLOGISTS (CCHST)

Safety Trained Supervisors in Construction and Mining

	<i>Classification</i>	<i>Test Specifications</i>
Task 1: Conduct risk assessments by performing pre-task hazard analyses and evaluating PPE, tools, equipment, and job expectations in order to mitigate potential hazards and minimize the risk of incident or injury.	010100	8
Knowledge of:		
a. Principles of risk assessment	010101	
b. Risk assessment procedures	010102	
c. Components of pre-task hazard analyses (e.g., job hazard analysis, job safety analysis, activity hazard analysis, job task analysis)	010103	
d. Hazards associated with tasks	010104	
e. Available and/or applicable PPE, tools, and equipment	010105	
f. Limitations of PPE, tools, and equipment	010106	
g. Proper use, care and maintenance requirements of PPE, tools, and equipment	010107	
Skill in:		
a. Communicating effectively	010108	
b. Developing and conducting pre-task hazard analyses	010109	
c. Recognizing hazards and mitigating exposure	010110	
d. Using, caring for, and maintaining PPE, tools, and equipment	010111	
e. Inspecting for the proper use, care, and maintenance of PPE, tools, and equipment	010112	
f. Using testing equipment (e.g., air quality, air velocity, noise)	010113	
g. Creating proper documentation	010114	
Task 2: Confirm that employees have the necessary job-specific technical skills and qualifications by observing work practices and/or reviewing training records in order to ensure competent staff.	010200	6
Knowledge of:		
a. Work practices and procedures	010201	
b. Procedures for observing work practices	010202	
c. Training requirements for the job tasks	010203	
d. Location and organization of training records	010204	

e. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)	010205	
Skill in:		
a. Recognizing desirable and undesirable workplace behavior	010206	
b. Measuring employees' performance through observation	010207	
c. Accessing and reading training records	010208	
d. Applying applicable standards to the evaluation of employees' technical skills	010209	
Task 3: Ensure that personnel in the work area are oriented to safety and health considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.	010300	8
Knowledge of:		
a. Principles of hazard assessment	010301	
b. Components of new hire orientation programs	010302	
c. Principles of risk assessment	010303	
d. Components of emergency action plans	010304	
e. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)	010305	
f. Principles of behavior-based safety	010306	
g. Characteristics of proactive and reactive safety cultures	010307	
Skill in:		
a. Communicating hazards	010308	
b. Conducting new employee orientations	010309	
c. Recognizing hazards and mitigating exposure	010310	
d. Conducting worksite inspections	010311	
e. Conducting safety meetings	010312	
f. Coaching safe behavior	010313	
g. Comparing safety performance to applicable standards	010314	
h. Communicating the emergency action plan	010315	
Task 4: Evaluate work practices by observing employees' behavior and their use of PPE, tools, and equipment in order to minimize the risk of incident or injury and comply with applicable standards.	010400	8
Knowledge of:		
a. Work practices and procedures	010401	
b. Types of work place behavior (e.g., proactive, impaired)	010402	
c. Available and/or applicable PPE, tools, and equipment	010403	
d. Limitations of PPE, tools, and equipment	010404	
e. Proper use, care and maintenance requirements of PPE, tools, and equipment	010405	
f. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)	010406	

Skill in:		
a. Recognizing desirable and undesirable workplace behavior (e.g., proactive, drug abuse, alcohol use)	010407	
b. Measuring employees' performance through observation	010408	
c. Defusing emotionally charged situations	010409	
Task 5: Ensure safety and health standards are implemented through coaching and by correcting observed deficiencies in order to maintain a safe and healthful work environment.	010500	7
Knowledge of:		
a. Methods for implementing safety and health rules and regulations	010501	
b. Methods for coaching employees	010502	
c. Methods for correcting observed deficiencies	010503	
d. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)	010504	
Skill in:		
a. Coaching employees	010505	
b. Correcting observed deficiencies	010506	
c. Applying safety and health standards appropriately	010507	
Task 6: Take appropriate action when confronted with unsafe acts and conditions by exercising stop-work authority, modifying tasks, escalating issues to higher management, consulting with qualified professionals (when the matter is outside the scope of the supervisor's capabilities, etc.), and disciplining employees in order to minimize the risk of incident or injury.	010600	8
Knowledge of:		
a. Work practices and procedures	010601	
b. Types of work place behavior (e.g., proactive, impaired)	010602	
c. Unsafe acts and conditions	010603	
d. Stop-work policy and procedure	010604	
e. Modifications of tasks to improve safety	010605	
f. Organizational chart and lines of communication	010606	
g. Disciplinary action policies and procedures	010607	
h. Roles and responsibilities of management and coworkers	010608	
Skill in:		
a. Recognizing unsafe acts and conditions	010609	
b. Responding to unsafe acts and conditions	010610	
c. Exercising leadership	010611	
d. Communicating effectively	010612	
e. Documenting unsafe behaviors and conditions and actions taken	010613	
Task 7: Facilitate a positive, proactive safety culture by anticipating hazards, modeling and coaching safe behavior, reporting incidents, encouraging employee participation, and communicating performance measures in order to enhance safety and health.	010700	7

Knowledge of:		
a. Characteristics of a positive, proactive safety culture	010701	
b. Safe work practices and procedures	010702	
c. Types of work place behavior (e.g., proactive, impaired)	010703	
d. Methods for modeling and coaching employees	010704	
e. Methods for correcting observed deficiencies (e.g., stop work authority, work modification)	010705	
f. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)	010706	
g. Policy and procedure related to incident reporting	010707	
Skill in:		
a. Recognizing and rewarding safe work practices	010708	
b. Correcting observed deficiencies	010709	
c. Conducting safety meetings	010710	
d. Modeling and coaching employees	010711	
e. Applying safety and health standards appropriately	010712	
Task 8: Evaluate employees using safety performance and behavior as key criteria in order to hold employees accountable for safety.	010800	6
Knowledge in:		
a. Components of employee performance systems	010801	
b. Essential behavior to include in performance evaluations (e.g., job safety requirements, attitude toward safety, use of PPE, tools and equipment)	010802	
c. Principles of behavior-based safety	010803	
d. Methods for encouraging proactive workplace behavior	010804	
e. Methods for holding employees accountable for safe work performance (e.g., positive reinforcement, negative reinforcement)	010805	
Skill in:		
a. Making objective observations	010806	
b. Comparing safety performance to applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)	010807	
c. Providing feedback on safe work performance	010808	
d. Communicating proactively	010809	
e. Listening to suggestions	010810	
f. Taking disciplinary action	010811	
Task 9: Participate in investigations that determine causes, identify corrective actions, document lessons learned, and address employee concerns using recognized investigation techniques in order to minimize the risk of workplace incidents.	010900	6
Knowledge of:		
a. Work practices and procedures	010901	
b. Types of work place behavior (e.g., proactive, impaired)	010902	

c. Available and/or applicable PPE, tools, and equipment	010903	
d. Limitations of PPE, tools, and equipment	010904	
e. Proper use, care and maintenance requirements of PPE, tools, and equipment	010905	
f. Principles of incident investigation	010906	
g. Roles and responsibilities of various personnel involved with investigations	010907	
h. Communication requirements related to investigations at all organizational levels (e.g., crisis management, company policy)	010908	
i. Methods for evaluating the implementation and effectiveness of emergency action plans	010909	
j. Development and uses of lessons learned	010910	
Skill in:		
a. Conducting incident investigations	010911	
b. Identifying corrective actions	010912	
c. Accessing and documenting lessons learned	010913	
d. Addressing employees' concerns	010914	
e. Communicating appropriately	010915	
Task 10: Verify the effectiveness of emergency action plans through training and practice in order to ensure effective response in crises.	011000	5
Knowledge in:		
a. Principles of emergency action planning	011001	
b. Components of emergency action plans	011002	
c. Training techniques and exercises (e.g., simulation, drill)	011003	
d. Crisis management techniques that include first response protocols	011004	
Skill in:		
a. Communicating the emergency action plan	011005	
b. Conducting emergency action drills	011006	
c. Conducting training in emergency action plans and crisis plans	011007	
d. Preparing after-action reports that include lessons learned	011008	
Task 11: Coordinate operations and work processes with other supervisors by communicating effectively in order to minimize risk.	011100	6
Knowledge of:		
a. Roles and responsibilities of other management personnel	011101	
b. Work practices and procedures	011102	
c. Available and/or applicable PPE, tools, and equipment	011103	
d. Communication strategies and requirements	011104	
e. Crew coordination techniques (e.g., between shift changes, upon recognizing adjacent area hazards)	011105	
f. Inspection and documentation procedures	011106	
g. Hazards related to work process	011107	
Skill in:		

a. Communicating effectively	011108	
b. Using standard terminology	011109	
c. Recognizing hazards and mitigating exposure	011110	
d. Minimizing exposure through risk assessment	011111	
e. Recording shift events	011112	
Task 12: Perform safety and health-related record keeping in accordance with applicable standards using established procedures in order to document essential processes.	011200	8
Knowledge in:		
a. Events that require documentation (e.g., task analysis, safety meetings, on-the-job training, inspections, incident investigations)	011201	
b. Safety and health record keeping systems	011202	
c. Sources for applicable standards (e.g., consensus standards, government agencies, manufacturers, company policy)	011203	
d. Confidentiality requirements	011204	
Skill in:		
a. Writing clearly and effectively	011205	
b. Using established documentation procedures and forms	011206	
c. Maintaining confidentiality of records	011207	
Task 13: Comply with company and STS codes of ethics by resolving issues consistently with these requirements in order to protect the interests of employees, employers, and other stakeholders.	011300	4
Knowledge of:		
a. Components of company and STS codes of ethics	011301	
Skill in:		
a. Resolving issues ethically	011302	
b. Communicating effectively	011303	

Appendix A: Role Delineation Panel Participants

Harry Galer
Certified Mine Safety Professional
15 years construction supervision
10 years mining supervision

Hugh Lawrence
Emergency Medical Technician
10 years construction supervision
25 years mining supervision

Scott Benson
Safety Trained Supervisor
Certified Safety Professional
10 years construction supervision

William Craig
Certified Safety Professional
10 years construction supervision
25 years mining supervision

Joe Rhoades
21 years mining supervision

Ronald Shippy
20 years construction supervision
10 years mining supervision

Marty Haaland
Safety Trained Supervisor
30 years construction supervision

James Hinze
Construction Health and Safety Technician
Certified Safety Professional
Associate in Risk Management
6 years construction supervision
2 years mining supervision

Andy Peters
17 years construction supervision
11 years mining supervision

Cary Gornick
15 years construction supervision
13 years mining supervision

Hank Ansley
15 years construction supervision

Bob Dice
Safety Trained Supervisor
Certified Safety Professional
Licensed Professional Engineer
35 years construction supervision
25 years mining supervision

Rick Callor
Safety Trained Supervisor
Certified Safety Professional
10 years construction supervision
13 years mining supervision

Appendix B: CCHES Online Survey

Certifying_organization_acronym:	CCHES
Certifying_organization:	Council on Certification of Health, Environmental and Safety Technologists
Survey_target:	Safety Trained Supervisors in Construction and Mining
Survey_target_acronym:	STS Construction and Mining
Survey_deadline:	

LOGO



DEFINITIONS

The Safety Trained Supervisor (STS) certification program is intended for individuals who:

- Are managers at any level.
- Are first line supervisors of work groups or organization units.
- Have a safety responsibility for a work group that is part of other work duties.

Safety Trained Supervisors are not safety specialists or practitioners. Typically they have a safety responsibility that is adjunct, collateral, or ancillary to their job duties. Their main job duties are in a craft or trade, in leadership, supervision, or management, or in a technical specialty. The Safety Trained Supervisor helps an employer implement safety programs at the worker level through supervisory, safety committee, or similar safety and health leadership roles. Safety tasks often include monitoring for hazards, helping ensure regulatory compliance, training employees in safety practices, performing safety record keeping tasks, coordinating corrections for safety problems within or among work groups, and communicating with safety specialists or management. The STS safety responsibility is part-time, usually less than 1/3 of the total job duties.

MINIMALLY COMPETENT STATEMENT

STS certification establishes a minimum competency in general safety practices. To achieve the certification, candidates must meet minimum safety training and work experience and demonstrate knowledge of safety fundamentals and standards by examination. Those holding the STS-Construction or

STS-Mining certification must renew it annually and meet recertification requirements every five years. To gain eligibility for a Safety Trained Supervisor examination, applicants must be of good moral character and meet the following three requirements:

1. Have two years of experience in any industry or in the industry related to the version of the STS examination to be taken.
2. Have one year of experience as a supervisor or safety leader of a work group. Examples are manager, foreman, crew chief, superintendent, or member of a safety committee. This experience can be concurrent with Requirement #1.

2a. If individuals are training to become a supervisor or safety leader and do not have the one year of experience in such roles, two additional years of industry experience can be substituted in Requirement #1.

3. Have completed 30 hours of formal safety training through a single course or multiple training courses.

To achieve the STS certification, candidates must pass a Safety Trained Supervisor examination.

DEMOGRAPHICS

1. Gender: *(Check only one.)*
 Female Male
2. Age: *(Check only one.)*
 Under 20 years 30-39 years 50-60 years
 20-29 years 40-49 years More than 60 years
3. In which state or province do you live?

4. What is the name of your current employer?

5. In what industry would your current employer be categorized? *(Check only one.)*
 Building construction—general contractor Surface mining
 Construction—other than building construction or general contractor Underground mining
 Construction—special trades Other *(Please specify.)* _____

6. What is your current position? *(Check only one.)*
- | | | |
|---|-------------------------------------|--------------------------------|
| <input type="checkbox"/> Foreman | <input type="checkbox"/> Crew chief | <input type="checkbox"/> Other |
| <input type="checkbox"/> Superintendent | <input type="checkbox"/> Retired | |
7. How many years have you worked as a foreman, supervisor, superintendent, or crew chief? *(Check only one.)*
- | | | |
|--|--------------------------------------|---|
| <input type="checkbox"/> Less than 3 years | <input type="checkbox"/> 6-10 years | <input type="checkbox"/> 16-20 years |
| <input type="checkbox"/> 3-5 years | <input type="checkbox"/> 11-15 years | <input type="checkbox"/> More than 20 years |
8. How many employees work at your facility? *(Check only one.)*
- | | | |
|--|--|--|
| <input type="checkbox"/> 1-10 employees | <input type="checkbox"/> 26-50 employees | <input type="checkbox"/> 76-100 employees |
| <input type="checkbox"/> 11-25 employees | <input type="checkbox"/> 51-75 employees | <input type="checkbox"/> More than 100 employees |
9. How many employees do you supervise? *(Check only one.)*
- | | | |
|---|--|---|
| <input type="checkbox"/> None | <input type="checkbox"/> 11-25 employees | <input type="checkbox"/> 51-75 employees |
| <input type="checkbox"/> 1-10 employees | <input type="checkbox"/> 26-50 employees | <input type="checkbox"/> More than 75 employees |
10. How many hours of formal safety and health-related training have you received, excluding formal academic coursework? *(Check only one.)*
- | | | |
|-------------------------------------|--------------------------------------|--|
| <input type="checkbox"/> None | <input type="checkbox"/> 30-49 hours | <input type="checkbox"/> 100-150 hours |
| <input type="checkbox"/> 1-29 hours | <input type="checkbox"/> 50-99 hours | <input type="checkbox"/> More than 150 hours |
11. In what industries would your previous employers be categorized? *(Select all that apply.)*
- | | |
|---------------------------------------|---|
| <input type="checkbox"/> Construction | <input type="checkbox"/> Other <i>(Please specify.)</i> |
| <input type="checkbox"/> Mining | _____ |
12. What is your highest level of education? *(Select all that apply.)*
- | | |
|--|--|
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Bachelor's degree |
| <input type="checkbox"/> High school diploma (GED) | <input type="checkbox"/> Master's degree |
| <input type="checkbox"/> Some college courses | <input type="checkbox"/> Doctoral degree |
| <input type="checkbox"/> Associate degree | |
13. Which of the following credentials do you hold? *(Select all that apply.)*
- | | | |
|-------------------------------|-------------------------------|---|
| <input type="checkbox"/> CHMM | <input type="checkbox"/> CSP | <input type="checkbox"/> PE |
| <input type="checkbox"/> CHST | <input type="checkbox"/> STS | <input type="checkbox"/> Other <i>(Please specify.)</i> |
| <input type="checkbox"/> CIH | <input type="checkbox"/> OHST | _____ |

CCHEST_SURVEY_TASKS

TASK_ID	TASKS
1	Conduct risk assessments by performing pre-task hazard analyses and evaluating PPE, tools, equipment, and job expectations in order to mitigate potential hazards and minimize the risk of incident or injury.
2	Confirm that employees have the necessary job-specific technical skills and qualifications by observing work practices and/or reviewing training records in order to ensure competent staff.
3	Ensure that personnel in the work area are oriented to safety and health considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.
4	Evaluate work practices by observing employees' behavior and their use of PPE, tools, and equipment in order to minimize the risk of incident or injury and comply with applicable standards.
5	Ensure safety and health standards are implemented through coaching and by correcting observed deficiencies in order to maintain a safe and healthful work environment.
6	Take appropriate action when confronted with unsafe acts and conditions by exercising stop-work authority, modifying tasks, escalating issues to higher management, consulting with qualified professionals (when the matter is outside the scope of the supervisor's capabilities, etc.), and disciplining employees in order to minimize the risk of incident or injury.
7	Facilitate a positive, pro-active safety culture by anticipating hazards, modeling and coaching safe behavior, reporting incidents, encouraging employee participation, and communicating performance measures in order to enhance safety and health.
8	Evaluate employees using safety performance and behavior as key criteria in order to hold employees accountable for safety.
9	Participate in investigations that determine causes, identify corrective actions, document lessons learned, and address employee concerns using recognized investigation techniques in order to minimize the risk of workplace incidents.
10	Verify the effectiveness of emergency action plans through training and practice in order to ensure effective response in crises.
11	Coordinate operations and work processes with other supervisors by communicating effectively in order to minimize risk.
12	Perform safety and health-related record keeping in accordance with applicable standards using established procedures in order to document essential processes.
13	Comply with company and STS codes of ethics by resolving issues consistently with these requirements in order to protect the interests of employees, employers, and other stakeholders.

Appendix C: Other industry categories of current employer

Other Industry
Architect- Designer
Construction - Infrastructure and Heavy Civil
Construction Management
Construction Management
consulting
Consulting/Mining/Defense/Construction/CM
Contracted with US Army on various construction projects
D&D and Environmental cleanup
Decontamination, Deactivation, Decommissioning, and Demolition
Demolition
Design/Engineering/Construction
Engineer, Procure, Construct
Engineering
Engineering
Engineering / Construction
Engineering / Design / CM
Engineering and Construction
Engineering and Construction
Engineering and Construction
Engineering and construction management
engineering and oil and gas
Engineering Design (Civil)
Engineering, Construction, Planning, CM, Mining
Environmental Cleanup
Environmental Remediation
Environmental Restoration (D&D/remediation)
EPC
EPC Contactor (Engineering, Procurement, Construction)
Fuel marketing
Gas Pipeline
Heavy Civil Construction
Heavy Equipment
Heavy marine construction
Infrastructure engineering
Integrated Services-EPC Contractor
Nuclear
Occupational Safety & Health consulting
Offshore
offshore oil production
Oil and Gas
Oil and Gas Industry
Oil Industry
Oil industry

Other Industry
Oil Spill Response
Power Generation
Power Plant Construction Management
Professional planning, engineering and architectural design, environmental, construction, and program and construction management services and a wide range of specialized technical services.
Radiation Protection
Radiation Safety
Railroad Operations
Safety and Health
Safety Consulting
Waste repository

Appendix D: Other Industry of Previous Employers

Other Industry of Previous Employers
City Government
College
Demolition
DOD
Drilling
Education
Electric Generating
Electric Utility
Electrical transmission and distribution
Emergency Health Care
Emergency Medical Service
Engineering
Engineering
Engineering
Engineering - Civil
Engineering & construction
Engineering and Construction
Engineering Design
Engineering/Architecture
Engineering/Construction management
Environmental Consulting
Equipment Maintenance
Equipment sales & service
Facility Deactivation and Demolition
Forging & social services
Gas Pipeline
General Industry
Government
Heavy Equipment
Hospitality
HSE
Law Enforcement
Manufacturing
Manufacturing
Military
Military
Nuclear
Oil and Gas
Oil and Gas
Oil and gas
Oil and Gas Industry
Oil Industry
Oilfield

Other Industry of Previous Employers
Operations
Plant Operations
Power Plant Operations
Public safety
Pulp & Paper
Rail
Railroads
Ranching
Same
Service
Shipyard
Specialty trailer building
State
Survey and Engineering
US Army
USN
Water resources and environmental