

**ROLE DELINEATION STUDY
FOR**

**Occupational Health and Safety
Technologist[®] and Loss Control Specialist
Examinations**

**CCHEST Technical Report 2003-1
March 2003**



**Council on Certification of Health, Environmental and Safety Technologists
208 Burwash Avenue
Savoy, IL 61874**

With assistance from

**CASTLE Worldwide, Inc.
Research Triangle Park, North Carolina**

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PURPOSE AND BACKGROUND

The purpose of this report is to summarize the procedures used to conduct the Occupational Health and Safety Technologist® (OHST) role delineation study and the results obtained from this study. The Council on Certification of Health, Environmental and Safety Technologists (CCHHEST) commissioned this role delineation study to update the examination blueprint for the OHST examination. CCHHEST uses this examination to evaluate the safety- and health-related knowledge and skills of safety and health practitioners and loss control specialists prior to awarding them the OHST designation.

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. This validation was conducted in accordance with the federal *Uniform Guidelines on Employee Selection Procedures* and the 1999 text entitled *Standards for Educational and Psychological Testing* published by the American Educational Research Association.

CCHHEST started the OHST designation in 1986. To ensure the validity of the examination leading to this certification, CCHHEST relied on experienced psychometricians and a recognized firm providing psychometric services to lead the first role delineation study relating to safety and health practices for safety and health technologists. CCHHEST commissioned this revalidation study in 2002, and it was completed and approved by the CCHHEST Board of Directors in 2003.

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. This role delineation study followed procedures that resulted in a function-based examination blueprint. In conducting this study, CCHHEST relied on the psychometric staff of CASTLE Worldwide to conduct most of the tasks necessary to complete the study. CCHHEST is especially grateful to the loss control specialists, safety and health practitioners, and current OHST certificate holders who volunteered their time to serve on the panel of experts and to complete validation surveys.

METHODOLOGY OVERVIEW

The role delineation study involved three phases. The first phase involved developing and validating the roles performed by OHST certificate holders and loss control specialists and the knowledge and skills necessary for certificate holders and loss control specialists 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 fields of loss control and traditional safety and health technology. 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.

Phase 1. Initial Development and Validation

CCHEST selected a panel of 17 experts in loss control and safety and health practice (Annex, Appendix A) to participate in a two-day workshop conducted in-person in August 2002. The panel represented a variety of practices, geographic regions, and industries. A senior psychometrician from CASTLE Worldwide led the workshop. The group defined the major roles (tasks) necessary for competence as an OHST certificate holder or qualified loss control specialist.

The group then developed the knowledge OHST certificate holders and loss control specialists need for adequately performing the tasks. Once the knowledge was 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 certificate holders and loss control specialists. The proposed tasks along with their respective knowledge statements were compiled and used as the basis for the validation surveys sent to the representative sample of existing loss control specialists and safety and health technologists.

Phase 2. Validation Study

To conduct this phase, CASTLE Worldwide and CCHEST developed a survey instrument (Annex, Appendix E) to validate the work of the 17-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 loss control and traditional safety and health practice was obtained. The survey then asked the respondents to evaluate the task statements proposed by the 17-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 1,000 practitioners in both fields, and 342 useable responses were returned. The data from the surveys were then used to develop the test specification in Phase 3.

Phase 3. Development of Examination Specifications

The final phase of the role delineation study was 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 in Table 1.

Phase 4. Implementation of Examination Specification

When approved by the CCHEST Board of Directors, the blueprint and examination specification shown in Table 1 forms the basis for future editions of the OHST examination. In addition, should individual state occupational licensing boards or state departments of insurance regulation accept the blueprint and examination specification shown in Table 1 as reflecting the roles and related knowledge and skills for entry-level loss control specialists, the OHST examination can serve as a qualification instrument.

DISCUSSION

To ensure that the OHST examination also accurately reflects the roles and responsibilities of entry-level loss control specialists (particularly those who provide loss control services for insurance companies), CCHESST teamed with subject matter experts representing several insurance firms and insurance trade organizations (Annex, Appendix A). Thus, the OHST examination was validated with subject matter experts representing traditional occupational safety and health technology as well as loss control. The purpose of merging these two similar functions is to ensure that the OHST examination is a psychometrically defensible measurement instrument to certify or qualify practitioners in both fields. Therefore, individual state occupational licensing boards and state departments of insurance regulation may also use this psychometrically valid OHST examination to qualify entry-level loss control specialists to practice within these states.

The members of the panel did recognize differences between the roles of loss control specialists and traditional OHSTs. Traditional OHSTs and loss control specialists have different functions within their respective organizations. OHSTs typically are implementers of the functional tasks described in the blueprint. As implementers, OHSTs actually perform the tasks or directly supervise other staff who perform the tasks. Loss control specialists must also have a thorough knowledge of the tasks described in the blueprint, including how to implement and evaluate the tasks and how to assess how other organizations implement the tasks. However, loss control specialists themselves typically would not perform or implement the tasks on behalf of an employer or client.

After discussing this difference, the panel agreed that the knowledge and skills required of OHSTs and qualified entry-level loss control specialists were the same. The Phase 2 validation confirmed the panel's assessment of these similarities (Annex, pages 25, 31-32). According to the role delineation study for the OHST examination conducted by CASTLE Worldwide, "the domains, tasks, knowledge, and skills developed by the role delineation panel constitute an accurate definition of a credentialed OHST and Loss Control Specialist" (Annex, page 34).

Table 1. OHST Blueprint and Examination Specification

DOMAIN 1 Worksite Assessment • 34%	
Task 1 Research information pertaining to the business or operation using appropriate tools and references (e.g., World Wide Web; federal and state regulations; consensus standards; and insurance loss control references) to obtain general risk data.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. World Wide Web 2. Internet search techniques 3. Computer databases 4. Insurance and loss control references 5. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT) 6. Standard certifications and approvals (e.g., ANSI, ASTM, NIOSH, NFPA, and API) 7. Basic biological sciences, including toxicology and ergonomics 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Using computers and software packages 2. Using Internet search engines 3. Using basic research techniques
Task 2 Evaluate actual business and operations data (e.g., monitoring and surveillance data; OSHA logs; incident reports; safety and health programs; and insurance loss data) by comparing the data against internal history as well as national or industry standards in order to recognize and define risks.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Benchmark standards (e.g., TLVs and PELs) 2. Acceptable ratios (e.g., loss ratios, incident rates, and accident rates) 3. Data sampling procedures 4. Business terminology (e.g., financial terms) 5. Basic mathematics (e.g., algebra and ratios) 6. Spreadsheet, word processor, and database software 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Analytical thinking (comparisons) 2. Communicating through talking and writing 3. Using computers and software packages
Task 3 Conduct surveys of the business or operation in accordance with accepted survey methodology (e.g., observing the facility; referring to process flow charts; verifying safety and health systems; programs and documentation; and interviewing employees and management) in order to recognize hazards and controls.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Properties of hazardous materials (e.g., basic chemistry and material safety data sheets) 2. Basic machine guarding techniques 3. Survey techniques (e.g., checklist, flow chart, and interviewing techniques) 4. Basic building design and construction (e.g., blueprints and major systems) 5. Behavioral science, including human factors 6. Sampling techniques (e.g., air sampling and noise monitoring) 7. Fire prevention and suppression equipment 8. Safety and health regulations and best practices 9. Life safety standards 10. Basic biological sciences, including toxicology and ergonomics 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Conducting interviews 2. Calibrating test equipment 3. Surveying facilities and operations 4. Reading blueprints 5. Measuring building dimensions 6. Computing sample sizes and interpreting data
Task 4 Communicate the results of surveys to management with appropriate documentation in order to educate management about risks and to recommend and justify appropriate actions for managing current and potential loss scenarios.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT) 2. Basic cost-benefit analysis 3. Organizational types and structures 4. Typical communication channels 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Communicating through talking and writing 2. Interpreting regulations 3. Operating within the corporate environment

Table 1. OHST Blueprint and Examination Specification (cont'd)

DOMAIN 2 Hazard Control and Loss Prevention • 31%	
Task 1 Evaluate risks using established analytical techniques in order to prioritize corrective actions.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Formulas (e.g., mathematical, scientific, and statistical) 2. Problem solving techniques 3. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT) 4. Industry standards and best practices 5. Internal standards 6. Basic biological sciences, including toxicology and ergonomics 7. Basic life and physical sciences 8. Basic health concepts 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Interpreting exposure limits 2. Reading material safety data sheets 3. Thinking critically
Task 2 Select hazard control measures by reviewing available options and choosing the most appropriate in order to manage risk.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT) 2. Industry standards and best practices 3. Industrial processes 4. Administrative controls 5. Personal protective equipment 6. Engineering controls 7. Hierarchy of controls 8. Basic ventilation 9. Basic machine guarding techniques 10. Basic life and physical sciences 11. Basic engineering concepts 12. Basic ventilation measurement 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Selecting personal protective equipment 2. Thinking critically
Task 3 Communicate the identified hazard control measures (e.g., recommend engineering, administrative, and personal protective equipment controls) by identifying essential resources and implementation strategies in order to manage risk.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Organizational types and structures 2. Strategies for prioritization of risks, hazard control measures, etc. 3. Necessary financial resources 4. Basic cost-benefit analysis 5. Basic financial terminology 6. Safety and health programs 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Communicating through talking and writing 2. Negotiating 3. Presenting 4. Teaching
Task 4 Assist with the implementation of controls as appropriate (e.g., organize committees; plan, conduct or provide training; maintain records; collect data; collaborate with contractors; select equipment; and manage respirator, confined space entry, lock out/tag out, and other safety and health programs) in order to manage risk.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. OSHA record keeping 2. Safety and health programs 3. Protocols for the calibration, maintenance, and use of sampling/monitoring equipment 4. Effective training solutions 5. Industry standards 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Organizing 2. Managing projects 3. Interpreting analytical data 4. Influencing and persuading others 5. Training 6. Researching and gaining access to documents 7. Calibrating, maintaining, and using sampling/monitoring equipment

Table 1. OHST Blueprint and Examination Specification (cont'd)

DOMAIN 3 Verification • 17%	
Task 1 Verify that recommended hazard controls are implemented using management and evaluation techniques (e.g., site surveys, review of records, audits, interviews with key personnel, and follow up with the responsible individuals) in order to ensure risks are adequately managed.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT) 2. Standard certifications and approvals (e.g., ANSI, ASTM, NIOSH, NFPA, and API) 3. Industry standards and best practices 4. Properties of hazardous materials (e.g., basic chemistry and material safety data sheets) 5. Behavioral science, including human factors 6. Material safety data sheets 7. Basic life and physical sciences 8. Organizational types and structures 9. Types of and methods for conducting audits (e.g., internal and regulatory) 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Conducting interviews 2. Listening actively 3. Using computers and software packages 4. Conducting verification audits and site surveys 5. Communicating through talking and writing
Task 2 Investigate incidents, accidents, and near misses using established techniques in order to determine root causes and formulate or update corrective action plans.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Basic elements of risk analysis (e.g., failure mode and effects analysis, fault tree analysis, and root cause analysis) 2. Federal OSHA techniques for computing incidence rates 3. Hazard controls (e.g., engineering controls, administrative controls, and personal protective equipment) 4. Investigative techniques 5. Basic life and physical sciences 6. Basic mathematics (e.g., algebra and ratios) 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Computing incidence rates using federal OSHA techniques 2. Conducting interviews 3. Listening actively 4. Communicating through talking and writing
Task 3 Assess the effectiveness of specified hazard controls by analyzing performance data (e.g., records, loss data, incident rates, environmental samples, and incident reports) in order to ensure risks are adequately managed.	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Industrial hygiene sampling techniques 2. Industry (e.g., NAISS, BLS) incident rates 3. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT) 4. Standard certifications and approvals (e.g., ANSI, ASTM, NIOSH, NFPA, and API) 5. Types of medical surveillance 6. Basic life and physical sciences 7. Basic statistics 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Using sampling protocols 2. Calibrating, maintaining, and using sampling/monitoring equipment 3. Computing sampling volumes 4. Computing and interpreting statistical analyses

Table 1. OHST Blueprint and Examination Specification (cont'd)

DOMAIN 4 Disaster Planning and Emergency Response • 14%	
Task 1 Identify catastrophic and emergency response scenarios (e.g., fires/explosions, natural disasters, chemical releases, terrorism, and medical emergencies) using established techniques in order to anticipate risks.	
Knowledge 1. Consensus standards (e.g., NFPA) 2. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT) 3. Material safety data sheets 4. Modeling development 5. Local, regional, and federal resources (e.g., civil defense, FEMA, local fire and police, medical facilities) 6. Characteristics of emergencies and natural disasters 7. Behavioral science, including human factors 8. System failures 9. Prior analyses conducted at the facility 10. Physical and electronic security	Skills 1. Basic modeling 2. Performing basic risk assessments 3. Identifying risk
Task 2 Evaluate scenarios using established techniques in order to characterize the probability and severity of occurrence.	
Knowledge 1. Basic risk assessment 2. Basic cost-benefit analysis 3. Organizational types and structures 4. Basic mathematics (e.g., algebra and ratios) 5. Basic life and physical sciences	Skills 1. Computing cost-benefit analysis 2. Using statistical analytical techniques 3. Using qualitative analytical techniques
Task 3 Develop response plans for scenarios by reviewing available options, selecting viable strategies, and documenting action plans in order to ensure appropriate response to disasters and other emergencies.	
Knowledge 1. Basic fire science 2. Behavioral science, including human factors 3. Basic life and physical sciences 4. Basic mathematics (e.g., algebra and ratios) 5. Properties of hazardous materials (e.g., basic chemistry and material safety data sheets) 6. Common methods of terrorism 7. Emergency equipment and supplies 8. Community response plans 9. Regulations (e.g., Incident Command System)	Skills 1. Communicating through talking and writing 2. Planning and developing disaster plans and emergency response
Task 4 Recommend administrative and engineering strategies for scenarios through communication with management in order to justify appropriate actions for managing responses to disasters and other emergencies.	
Knowledge 1. Characteristics of emergencies and natural disasters 2. Basic risk assessment 3. Administrative and engineering disaster response strategies 4. Basic life and physical sciences 5. Mutual aid agreements 6. Organizational types and structures	Skills 1. Communicating through talking and writing 2. Facilitating team process

Table 1. OHST Blueprint and Examination Specification (cont'd)

DOMAIN 4 (continued) Disaster Planning and Emergency Response	
Task 5 Assist with the implementation of assigned responsibilities for response plans as appropriate (e.g., organize committees, provide training, collaborate with contractors, select equipment, and manage specific programs) in order to ensure appropriate response to disasters and other emergencies.	
Knowledge	Skills
1. Behavioral science, including human factors 2. Adult learning principles 3. Available emergency equipment 4. Regulatory and consensus standards (e.g., EPA and OSHA) 5. Community response plans	1. Communicating through talking and writing 2. Facilitating committees 3. Training diverse populations
Task 6 Evaluate the currency and effectiveness of response plans at regularly scheduled intervals by reviewing their applicability for present and emerging conditions (e.g., changes in organizational structure, and new processes or materials) in order to update the plans and ensure appropriate response to disasters and other emergencies.	
Knowledge	Skills
1. Procedure, process, and equipment evaluation 2. Evaluation of training methods (e.g., exercises, drills, and surveys) 3. Emergency equipment inspection and required performance tests 4. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)	1. Using qualitative analytical techniques 2. Inspecting and using emergency equipment 3. Training diverse populations 4. Conducting and evaluating exercises, drills, and surveys
DOMAIN 5 Professional Responsibility • 4%	
Task 1 Apply the Health and Safety Technologist and Technician Code of Ethics.	
Task 2 Understand OHST disciplinary standards and procedures.	
Task 3 Participate in professional development.	

CONCLUSIONS

1. Based on the high Cronbach's Alpha reliability within each domain obtained from the results of the validation survey (Annex, page 33), this blueprint is an accurate representation of the tasks, knowledge, and skills required for OHSTs and entry-level loss control specialists to adequately perform their functions.
2. Though there were some statistical differences between the validation results from loss control specialists and those of current OHSTs, the impact of these statistical differences would not have translated into a different blueprint or examination specification.
3. Analysis of the knowledge areas developed for each responsibility support the use of a written, multiple-choice examination format based on practical considerations, such as cost, objectivity in scoring and the types of knowledge included in the study results.

ANNEX

Role Delineation Study of the Occupational
Health and Safety Technologist



Role Delineation Study of the Occupational Health and Safety Technologist

January 2003



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Introduction

In August 2002, a panel of 17 experts assembled by the Council on Certification of Health, Environmental, and Safety Technologists (CCHHEST) met with representatives from Columbia Assessment Services Testing and Learning Enterprises (CASTLE) Worldwide, Inc. to delineate the field of occupational health and safety technology.

A function of the CCHHEST credentialing program is to ensure competency and professionalism in the field of occupational health and safety technology. It provides assurance that the Certified Occupational Health and Safety Technologist has met specific criteria designed to ensure that he or she is competent in the technological provision of services related to occupational health and safety.

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 Worldwide, Inc. adheres to these standards in developing examinations for credentialing programs, including the CCHHEST Occupational Health and Safety Technologist certification program.

Before a content-valid examination is developed for a profession or occupation, the knowledge and skills needed to be a competent professional in the field 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. The job analysis also helps to determine the type of examination, such as written or practical, to be developed in order to assess competence.

The critical 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 utilized 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. A content-valid examination contains a representative sample of items that measure the knowledge or skills contained in the profession being tested.

Thus, the role delineation study works to ensure that an examination is content-valid in that the aspects of the profession covered on the examination reflect the tasks performed in practice settings. For both broad content areas and tasks, the study identified their importance, criticality, and frequency. These ratings play an important role in determining the content of the examination.

The role delineation study for the Council on Certification of Health, Environmental, and Safety Technologists consisted of the following three phases, which are the focus of this report:

- I. Initial Development and Validation. The 17-member role delineation panel identified the domains, tasks, knowledge, and skills essential to the performance of an Occupational Health and Safety Technologist.
- II. Validation Study. A representative sample of professionals in the fields of occupational health and safety technology and insurance industry loss control prevention 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 professionals, the test specifications for the certification examination were developed.

PHASE I INITIAL DEVELOPMENT AND EVALUATION

The first steps in analyzing the role and responsibilities of the Occupational Health and Safety Technologist were the identification of the major content areas or domains, the listing of tasks performed under each domain, and the identification of the knowledge and skills associated with each task.

In August 2002, CCHESST assembled a 17-member panel of subject matter experts in occupational health and safety technology and insurance industry loss control prevention to discuss the role of the Occupational Health and Safety Technologist. The panel members represented a variety of practice settings, geographic regions, and both genders. The following steps were undertaken to complete Phase I:

- A. The panel determined that the profession could be divided into five major content areas, or performance domains. These performance domains are:
 1. Worksite Assessment;
 2. Hazard Control and Loss Prevention;
 3. Verification;
 4. Disaster Planning and Emergency Response; and
 5. Professional Responsibility.
- B. Next, the panel delineated the tasks in each of the five domains. The panel subsequently generated a list of knowledge and skills required to perform each task.
- C. The panel members then evaluated each performance domain and task, rating each on importance and criticality to the OHST and the frequency with which the activities associated with each domain and task are performed.

Based on the work of the role delineation panel, a 10-page paper survey (see Appendix E) and an electronic survey were developed and sent to professionals in the fields of occupational health and safety technology and loss control prevention. The results of the survey are the focus of Phase II.

PHASE II VALIDATION STUDY

Questionnaire Design and Distribution

Using the domains and tasks identified by the role delineation panel, CASTLE Worldwide, Inc., developed an electronic and a 10-page paper questionnaire to be completed by a nationwide sample of professionals in the fields of occupational health and safety technology and loss control prevention. CASTLE distributed the paper questionnaire to 550 Occupational Health and Safety Technologists professionals and 100 insurance specialists, and the electronic survey was sent to 350 insurance professionals to evaluate, validate, and provide feedback on the role delineation panel's domain and task lists. Of the 1000 questionnaires distributed, 342 (34.2%) usable responses were returned to CASTLE.

Who Responded to the Survey?

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

Figure 1. Breakdown of Gender

As shown in the chart below, the majority of respondents (308, or 90.1%) were male.

GENDER		
	Frequency	Percent
Female	34	9.9
Male	308	90.1
Total	342	100.0

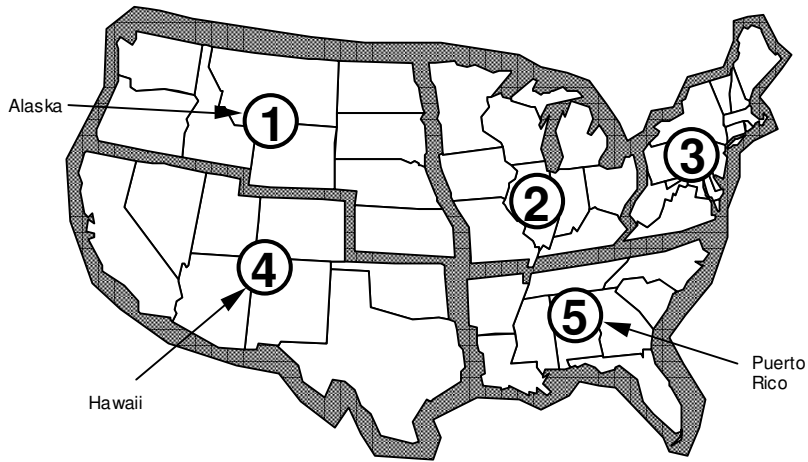
Figure 2. Breakdown of Age

The majority (95.9%) of the sample was more than 30 years of age. There were no respondents under the age of 20.

AGE		
	Frequency	Percent
Under 20 years	0	0.0
20-29 years	14	4.1
30-39 years	69	20.2
40-49 years	117	34.2
50-60 years	129	37.7
More than 60 years	13	3.8
Total	342	100.0

Figure 3. Breakdown of Location

As show below, all geographic regions were represented by the respondent sample. No geographic region had fewer than 25 respondents.



LOCATION		
	Frequency	Percent
1	29	8.5
2	70	20.5
3	62	18.1
4	98	28.7
5	52	15.2
Did not answer	31	9.1
Total	342	100.1*

* Variation in the sum of the percentages is due to rounding.

Figure 4. How would you describe your position?

Two-thirds of respondents reported their position as an Occupational Health and Safety Technologist. Eight individuals did not provide a response to this question. Given these figures, the response rate to the survey for Occupational Health and Safety Technologists is 41.6%, and for Loss Control Specialists it is 23.3%.

POSITION		
	Frequency	Percent
Occupational Health and Safety Technologist	229	67.0
Loss Control Specialist	105	30.7
Did not answer	8	2.3
Total	342	100.0

Figure 5. How many years have you worked as an OHST or Loss Control Specialist?

Almost all (99.8%) survey respondents had at least two years of experience as an OHST or Loss Control Specialist. More than half (56.8%) of respondents had more than 10 years of experience. Tenure information also is reported by job title on the following page.

TENURE		
	Frequency	Percent
Less than 2 years	1	0.3
2-5 years	40	11.7
6-10 years	107	31.3
11-15 years	82	24.0
16-20 years	53	15.5
More than 20 years	59	17.3
Total	342	100.1*

* Variation in the sum of the percentages is due to rounding.

TENURE BY JOB TITLE			
	OHST	Loss Control Specialist	Job title not provided
Less than 2 years	0 (0%)	1 (0.3%)	0 (0%)
2-5 years	25 (7.3%)	15 (4.4%)	0 (0%)
6-10 years	85 (24.9%)	20 (5.8%)	2 (0.6%)
11-15 years	52 (15.2%)	30 (8.8%)	0 (0%)
16-20 years	36 (10.5%)	15 (4.4%)	2 (0.6%)
More than 20 years	31 (9.1%)	24 (7.0%)	4 (1.2%)
Total	229 (67.0%)	105 (30.7%)	8 (2.3%)

Figure 6. Which of the following credentials do you hold?

As shown in the table below, 277 individuals reported holding the OHST credential. Ninety-six individuals reported holding a credential not provided on the list. Of those ninety-six individuals, twenty-two had previously reported that they were Loss Control Specialists. Those individuals who selected this response were invited to provide the credential they held that was not listed. A complete list of these credentials can be found in Appendix B. As respondents were invited to select all applicable credentials, there are more than 342 responses provided below.

CREDENTIALS	
	Frequency
ALCM	11 (3.2%)
ARM	12 (3.5%)
CHMM	13 (3.8%)
CHST	25 (7.3%)
CPCU	1 (0.3%)
CSP	82 (24.0%)
OHST	277 (81.0%)
Other	96 (28.1%)

Figure 7. Which of the following best describes your employer’s business?

Survey respondents worked in various types of businesses. More than one-fifth (21.6%) of survey respondents reported working in a type of business not listed. These verbatim responses are provided in Appendix C. No survey respondents reported their employer’s business was retail.

BUSINESS		
	Frequency	Percent
Construction	30	8.8
Governmental	42	12.3
Health Care	8	2.3
Insurance	85	24.9
Manufacturing	54	15.8
Petrochemical	34	9.9
Retail	0	0.0
Transportation	11	3.2
Retired	1	0.3
Other	74	21.6
Did not answer	3	0.9
Total	342	100.0

Figure 8. How many employees are in the health and safety or loss control department at your facility?

The survey respondents varied in their responses to this question. Although the most frequent response provided was 0-2 employees, many survey responses worked in larger departments, with more than one-fifth (21.6%) of respondents working in departments of more than 20 employees.

EMPLOYEES		
	Frequency	Percent
0-2 employees	93	27.2
3-5 employees	71	20.8
6-10 employees	58	17.0
11-15 employees	26	7.6
16-20 employees	19	5.6
More than 20 employees	74	21.6
Did not answer	1	0.3
Total	342	100.1*

* Variation in the sum of the percentages is due to rounding.

Figure 9. What percentage of time do you spend working in health and safety or loss control?

As shown below, the majority (79.8%) of respondents reported working in health and safety or loss control more than 80 percent of the time.

PERCENTAGE OF TIME		
	Frequency	Percent
0-20 percent	8	2.3
20-40 percent	9	2.6
40-60 percent	28	8.2
60-80 percent	23	6.7
80-100 percent	273	79.8
Did not answer	1	0.3
Total	342	99.9*

* Variation in the sum of the percentages is due to rounding.

Figure 10. What is your highest level of education?

The survey respondents were a well-educated group with almost all (97.20%) having at least taken some college courses. More than half (60.6%) reported having a bachelor's degree or higher. Tenure information also is reported by job title on the following page.

LEVEL OF EDUCATION		
	Frequency	Percent
High school diploma/GED	9	2.6
Some college courses	57	16.7
Associate degree	68	19.9
Bachelor's degree	162	47.4
Master's degree	44	12.9
Doctorate	1	0.3
Did not answer	1	0.3
Total	342	100.1*

* Variation in the sum of the percentages is due to rounding.

LEVEL OF EDUCATION BY JOB TITLE			
	OHST	Loss Control Specialist	Job title not provided
High school diploma/GED	7 (2.0%)	1 (0.3%)	0 (0%)
Some college courses	49 (14.3%)	7 (2.0%)	1 (0.3%)
Associate degree	49 (14.3%)	17 (5.0%)	2 (0.6%)
Bachelor's degree	93 (27.2%)	65 (19.0%)	4 (1.2%)
Master's degree	28 (8.2%)	15 (4.4%)	1 (0.3%)
Doctorate	1 (0.3%)	0 (0%)	0 (0%)
Did not answer	1 (0.3%)	0 (0%)	0 (0%)
Total	229 (66.6%)*	105 (30.7%)	8 (2.4%)*

* Variation in the sum of the percentages is due to rounding.

Figure 11. In which industry do you have the most experience as an OHST or Loss Control Specialist?

More than one-quarter (26.9%) of respondents reported manufacturing as the industry where they had the most experience. Seventy-eight respondents reported they had the most experience in another industry. Appendix D provides the other industries that respondents reported.

INDUSTRY		
	Frequency	Percent
Construction	50	14.6
Health Care	12	3.5
Insurance	63	18.4
Manufacturing	92	26.9
Petrochemical	33	9.6
Retail	2	0.6
Transportation	10	2.9
Other	78	22.8
Did not answer	2	0.6
Total	342	99.9*

* Variation in the sum of the percentages is due to rounding.

Evaluation of Performance Domains

A. Survey Respondents' Evaluations. The survey respondents were asked to evaluate each performance domain and task, rating it on importance, criticality, and frequency. A five-point scale was used for the importance and criticality ratings, with a "5" representing the highest rating. The scale anchors for importance and criticality are listed below as a reference. For the frequency ratings, survey respondents were asked to estimate the percentage of time that an OHST or Loss Control Specialist would spend performing the activities associated with the particular domain or task being rated.

Importance Ratings

1. **Not Important.** Performance of tasks in this domain is not essential to your performance as a competent OHST or entry-level Loss Control Specialist.
2. **Somewhat Important.** Performance of tasks in this domain is minimally essential to your performance as a competent OHST or entry-level Loss Control Specialist.
3. **Important.** Performance of tasks in this domain is moderately essential to your performance as a competent OHST or entry-level Loss Control Specialist.
4. **Very Important.** Performance of tasks in this domain is clearly essential to your performance as a competent OHST or entry-level Loss Control Specialist.
4. **Extremely Important.** Performance of tasks in this domain is absolutely essential to your performance as a competent OHST or entry-level Loss Control Specialist.

As depicted in the following charts, survey respondents indicated that Domain I (Worksite Assessment) is the most important of the five domains. Domain II (Hazard Control and Loss Prevention) was considered the second most important, followed by Domain V (Professional Responsibility). Domain IV (Disaster Planning and Emergency Response) was considered to be the least important domain.

Domain	IMPORTANCE			
	Sample Size (N)	Mean	Standard Error of Mean	Standard Deviation
I. Worksite Assessment	337	4.34	0.0424	0.778
II. Hazard Control and Loss Prevention	337	4.27	0.0431	0.791
III. Verification	335	3.38	0.0505	0.924
IV. Disaster Planning and Emergency Response	337	2.99	0.0577	1.059
V. Professional Responsibility	336	4.15	0.0525	0.963

Criticality Ratings

1. **No Harm.** Inability to perform tasks in this domain would have no adverse consequences.
2. **Minimal Harm.** Inability to perform tasks in this domain would lead to error with minimal adverse consequences.
3. **Moderate Harm.** Inability to perform tasks in this domain would lead to error with moderate adverse consequences.
4. **Significant Harm.** Inability to perform tasks in this domain would lead to error with major adverse consequences.
5. **Extreme Harm.** Inability to perform tasks in this domain would definitely lead to error with severe consequences.

The respondents considered Domain II (Hazard Control and Loss Prevention) as the most critical of the five domains, followed closely by Domain I (Worksite Assessment). Domain III (Verification) was considered the least critical.

Domain	CRITICALITY			
	Sample Size (N)	Mean	Standard Error of Mean	Standard Deviation
I. Worksite Assessment	329	4.07	0.0451	0.818
II. Hazard Control and Loss Prevention	329	4.16	0.0423	0.767
III. Verification	328	3.19	0.0524	0.949
IV. Disaster Planning and Emergency Response	329	3.54	0.0598	1.084
V. Professional Responsibility	328	3.37	0.0603	1.093

Frequency Ratings

Respondents were also asked to estimate the percent of time spent performing duties associated with each performance domain. The chart below depicts how the survey respondents estimated the frequency of each domain. Directions in the survey required respondents to ensure that percentages given for each domain added to 100%. However, 17 of the respondents who completed this section reported percentages that added to something other than 100%. Therefore, the sample size for all analyses of domain frequency contains only 307 respondents.

The respondents felt that approximately one-third (almost 33%) of their time is spent performing duties associated with Domain I (Worksite Assessment). Respondents also indicated that they spend an average of just over 29% of their time in Domain II (Hazard Control and Loss Prevention). Similar amounts of time are spent in Domains III (Verification) and Domain V (Professional Responsibility) (14% and 13%, respectively). The least amount of time reported spent (almost 11%) was in Domain IV (Disaster Planning and Emergency Response).

Domain	FREQUENCY			
	Sample Size (N)	Mean	Standard Error of Mean	Standard Deviation
I. Worksite Assessment	307	32.64	0.7642	13.389
II. Hazard Control and Loss Prevention	307	29.31	0.7017	12.295
III. Verification	307	14.28	0.4627	8.108
IV. Disaster Planning and Emergency Response	307	10.64	0.3759	6.586
V. Professional Responsibility	307	13.13	0.5093	8.924

B. Panel Members' Evaluation Vs. Respondents' Evaluations. The evaluations of domains by the panel members were compared to the evaluations of the survey respondents to ensure that the results were similar. As depicted in the graph below, both groups rated the importance of the domains similarly. The greatest difference (.69) was found in Domain III (Verification).

Domain	IMPORTANCE		
	Survey	Panel	Difference
I. Worksite Assessment	4.34	4.86	-0.52
II. Hazard Control and Loss Prevention	4.27	4.57	-0.30
III. Verification	3.38	4.07	-0.69
IV. Disaster Planning and Emergency Response	2.99	3.43	-0.44
V. Professional Responsibility	4.15	3.71	0.44

The two groups ranked the criticality of the domains similarly as well, with Domain III (Verification) again having the greatest difference (.67).

Domain	CRITICALITY		
	Survey	Panel	Difference
I. Worksite Assessment	4.07	4.21	-0.14
II. Hazard Control and Loss Prevention	4.16	4.36	-0.20
III. Verification	3.19	3.86	-0.67
IV. Disaster Planning and Emergency Response	3.54	4.07	-0.53
V. Professional Responsibility	3.37	3.07	0.30

The largest difference for frequency was found in Domain I (Work Site Assessment) with panel members reporting spending an average of almost nine percent more time in that domain.

Domain	FREQUENCY		
	Survey	Panel	Difference
I. Worksite Assessment	32.64	41.43	-8.79
II. Hazard Control and Loss Prevention	29.31	27.14	2.17
III. Verification	14.28	15.14	-0.86
IV. Disaster Planning and Emergency Response	10.64	9.57	1.07
V. Professional Responsibility	13.13	6.71	6.42

C. Survey Respondent Subgroups' Evaluations. When using a survey to collect information regarding a profession or occupation, the possibility that individuals in various settings may have differing views of their role and responsibilities is to be expected. Finding differences in domain or task ratings among the various subgroups would indicate that one should not generalize the survey results from one subgroup to another. With this in mind, the responses of specific subgroups were compared. Gender, position, level of experience, facility size, level of education, employer's business, and industry experience defined the subgroups. For the present study, it is particularly important to understand if OHSTs and Loss Control Specialists view their roles and responsibilities differently. These comparisons found that the responses of the various subgroups do not contain practical differences.

The following charts reflect the similarities in responses of the specific subgroups of respondents. Only minor variations occur between the responses. The similarity in the ratings provides support for generalizing from the survey results to the general population of Occupational Health and Safety Technologists and Loss Control Specialists.

GENDER

Domain	IMPORTANCE		
	Female	Male	Difference
I. Worksite Assessment	4.41	4.33	0.08
II. Hazard Control and Loss Prevention	4.18	4.28	-0.10
III. Verification	3.35	3.39	-0.04
IV. Disaster Planning and Emergency Response	2.82	3.00	-0.18
V. Professional Responsibility	4.03	4.16	-0.13

Domain	CRITICALITY		
	Female	Male	Difference
I. Worksite Assessment	4.03	4.07	-0.04
II. Hazard Control and Loss Prevention	4.15	4.16	-0.01
III. Verification	2.97	3.21	-0.24
IV. Disaster Planning and Emergency Response	3.64	3.53	0.11
V. Professional Responsibility	2.91	3.42	-0.51

Domain	FREQUENCY		
	Female	Male	Difference
I. Worksite Assessment	32.52	32.65	-0.13
II. Hazard Control and Loss Prevention	31.86	29.04	2.82
III. Verification	13.66	14.35	-0.69
IV. Disaster Planning and Emergency Response	10.66	10.64	0.02
V. Professional Responsibility	11.31	13.32	-2.01

POSITION

Domain	IMPORTANCE		
	OHST	Loss Control	Difference
I. Worksite Assessment	4.32	4.38	-0.06
II. Hazard Control and Loss Prevention	4.18	4.43	-0.25
III. Verification	3.32	3.52	-0.20
IV. Disaster Planning and Emergency Response	3.11	2.73	0.38
V. Professional Responsibility	4.18	4.09	0.09

Domain	CRITICALITY		
	OHST	Loss Control	Difference
I. Worksite Assessment	4.08	4.04	0.04
II. Hazard Control and Loss Prevention	4.15	4.17	-0.02
III. Verification	3.18	3.23	-0.05
IV. Disaster Planning and Emergency Response	3.58	3.49	0.09
V. Professional Responsibility	3.35	3.41	-0.06

Domain	FREQUENCY		
	OHST	Loss Control	Difference
I. Worksite Assessment	32.91	31.70	1.21
II. Hazard Control and Loss Prevention	27.75	32.94	-5.19
III. Verification	14.25	14.31	-0.06
IV. Disaster Planning and Emergency Response	11.30	9.28	2.02
V. Professional Responsibility	13.79	11.77	2.02

EXPERIENCE

Domain	IMPORTANCE				
	2-5 years	6-10 years	11-15 years	16-20 years	More than 20
I. Worksite Assessment	4.28	4.26	4.31	4.53	4.40
II. Hazard Control and Loss Prevention	4.33	4.25	4.23	4.18	4.43
III. Verification	3.33	3.24	3.49	3.41	3.52
IV. Disaster Planning and Emergency Response	2.88	2.95	3.11	2.92	3.03
V. Professional Responsibility	4.22	3.90	4.27	4.29	4.26

Domain	CRITICALITY				
	2-5 years	6-10 years	11-15 years	16-20 years	More than 20
I. Worksite Assessment	4.03	3.93	4.16	4.16	4.15
II. Hazard Control and Loss Prevention	4.34	4.15	4.11	4.00	4.25
III. Verification	3.09	2.98	3.26	3.39	3.36
IV. Disaster Planning and Emergency Response	3.37	3.62	3.61	3.49	3.45
V. Professional Responsibility	3.54	3.11	3.35	3.55	3.60

Domain	FREQUENCY				
	2-5 years	6-10 years	11-15 years	16-20 years	More than 20
I. Worksite Assessment	30.54	31.66	33.24	35.04	32.88
II. Hazard Control and Loss Prevention	31.97	30.51	28.31	26.89	28.85
III. Verification	13.66	13.44	14.73	15.26	14.77
IV. Disaster Planning and Emergency Response	10.57	11.30	10.85	9.81	10.04
V. Professional Responsibility	13.26	13.09	12.86	13.00	13.46

FACILITY SIZE (NUMBER OF EMPLOYEES)

Domain	IMPORTANCE					
	0-2	3-5	6-10	11-15	16-20	More than 20
I. Worksite Assessment	4.37	4.36	4.25	4.31	4.42	4.34
II. Hazard Control and Loss Prevention	4.29	4.13	4.28	4.19	4.37	4.38
III. Verification	3.29	3.36	3.46	3.64	3.42	3.39
IV. Disaster Planning and Emergency Response	3.16	2.96	2.77	3.15	2.79	2.95
V. Professional Responsibility	4.09	4.04	4.21	4.31	4.32	4.18

Domain	CRITICALITY					
	0-2	3-5	6-10	11-15	16-20	More than 20
I. Worksite Assessment	4.08	4.16	4.00	4.04	4.11	4.03
II. Hazard Control and Loss Prevention	4.13	4.25	4.04	4.04	4.17	4.23
III. Verification	3.14	3.19	3.22	3.23	3.11	3.25
IV. Disaster Planning and Emergency Response	3.62	3.50	3.62	3.31	3.39	3.56
V. Professional Responsibility	3.41	3.12	3.40	3.54	3.33	3.48

Domain	FREQUENCY					
	0-2	3-5	6-10	11-15	16-20	More than 20
I. Worksite Assessment	32.18	33.23	35.50	29.58	36.76	30.64
II. Hazard Control and Loss Prevention	29.05	29.75	28.10	30.83	28.24	29.92
III. Verification	13.74	13.31	15.30	15.83	13.76	14.79
IV. Disaster Planning and Emergency Response	11.84	10.86	9.20	10.63	8.88	10.39
V. Professional Responsibility	13.20	12.84	11.90	13.13	12.35	14.26

EDUCATION (see key below)

Domain	IMPORTANCE				
	1	2	3	4	5
I. Worksite Assessment	4.33	4.37	4.21	4.39	4.33
II. Hazard Control and Loss Prevention	3.67	4.23	4.21	4.35	4.26
III. Verification	3.67	3.26	3.39	3.38	3.45
IV. Disaster Planning and Emergency Response	3.11	2.89	2.83	3.00	3.26
V. Professional Responsibility	4.33	4.23	4.17	4.11	4.12

Domain	CRITICALITY				
	1	2	3	4	5
I. Worksite Assessment	4.44	4.11	4.03	4.08	4.02
II. Hazard Control and Loss Prevention	4.00	4.21	4.21	4.16	4.02
III. Verification	3.78	3.20	3.14	3.15	3.29
IV. Disaster Planning and Emergency Response	3.44	3.38	3.41	3.59	3.81
V. Professional Responsibility	3.78	3.59	3.14	3.37	3.37

Domain	FREQUENCY				
	1	2	3	4	5
I. Worksite Assessment	33.89	34.45	31.18	32.36	31.98
II. Hazard Control and Loss Prevention	22.22	26.89	29.09	29.57	29.75
III. Verification	20.56	13.62	14.35	14.17	13.38
IV. Disaster Planning and Emergency Response	10.56	10.04	9.68	10.75	11.83
V. Professional Responsibility	12.78	16.27	14.02	12.55	13.37

1=High school diploma/GED

2=Some college courses

3=Associate degree

4=Bachelor's degree

5=Master's degree

EMPLOYER'S BUSINESS (see key below)

Domain	IMPORTANCE							
	1	2	3	4	5	6	7	8
I. Worksite Assessment	4.57	4.32	4.38	4.37	4.23	4.18	4.64	4.35
II. Hazard Control and Loss Prevention	4.20	4.41	4.50	4.46	4.11	4.00	4.18	4.23
III. Verification	3.17	3.20	3.13	3.50	3.40	3.42	3.82	3.40
IV. Disaster Planning and Emergency Response	2.97	2.83	3.50	2.67	3.30	3.09	3.00	3.12
V. Professional Responsibility	4.24	4.17	3.75	4.15	4.00	4.24	3.91	4.23

Domain	CRITICALITY							
	1	2	3	4	5	6	7	8
I. Worksite Assessment	4.37	4.00	4.13	4.00	4.06	4.00	4.00	4.11
II. Hazard Control and Loss Prevention	4.27	4.17	4.38	4.14	4.11	4.03	4.27	4.18
III. Verification	3.27	3.34	3.13	3.12	3.11	3.18	3.45	3.16
IV. Disaster Planning and Emergency Response	3.63	3.41	4.13	3.30	3.72	3.70	3.73	3.51
V. Professional Responsibility	3.48	3.44	2.75	3.31	3.19	3.18	3.36	3.59

Domain	FREQUENCY							
	1	2	3	4	5	6	7	8
I. Worksite Assessment	32.93	35.14	32.50	32.40	29.90	32.19	35.00	33.47
II. Hazard Control and Loss Prevention	28.45	29.29	26.88	34.38	28.22	24.69	24.50	28.00
III. Verification	11.55	12.14	12.50	14.14	15.06	16.56	17.20	14.81
IV. Disaster Planning and Emergency Response	10.69	11.00	13.75	8.19	12.76	12.81	9.60	10.31
V. Professional Responsibility	16.38	12.43	14.38	10.89	14.06	13.75	13.70	13.41

1=Construction
 2=Governmental
 3=Health care
 4=Insurance

5=Manufacturing
 6=Petrochemical
 7=Transportation
 8=Other

INDUSTRY EXPERIENCE (see key below)

Domain	IMPORTANCE						
	1	2	3	4	5	6	7
I. Worksite Assessment	4.52	4.33	4.37	4.19	4.19	4.56	4.39
II. Hazard Control and Loss Prevention	4.30	4.42	4.47	4.26	3.94	4.00	4.26
III. Verification	3.20	2.83	3.56	3.41	3.39	3.78	3.37
IV. Disaster Planning and Emergency Response	2.86	3.58	2.68	3.16	3.03	2.78	3.03
V. Professional Responsibility	4.24	3.67	4.18	4.18	4.13	4.00	4.12

Domain	CRITICALITY						
	1	2	3	4	5	6	7
I. Worksite Assessment	4.20	4.25	4.05	4.07	4.03	4.13	3.99
II. Hazard Control and Loss Prevention	4.20	4.33	4.14	4.20	4.06	4.38	4.06
III. Verification	3.10	3.08	3.25	3.21	3.19	3.38	3.16
IV. Disaster Planning and Emergency Response	3.56	3.83	3.26	3.73	3.72	3.38	3.44
V. Professional Responsibility	3.56	3.17	3.44	3.38	3.16	2.88	3.30

Domain	FREQUENCY						
	1	2	3	4	5	6	7
I. Worksite Assessment	35.33	32.27	34.16	29.64	31.00	33.57	33.44
II. Hazard Control and Loss Prevention	27.83	25.91	32.14	31.19	27.33	26.43	28.13
III. Verification	12.72	13.64	14.16	14.43	16.50	16.71	14.10
IV. Disaster Planning and Emergency Response	9.04	15.00	8.21	11.42	13.00	9.43	11.40
V. Professional Responsibility	15.09	13.18	11.32	13.31	12.17	13.86	12.93

1=Construction
 2=Health care
 3=Insurance
 4=Manufacturing

5=Petrochemical
 6=Transportation
 7=Other

Statistical Tests of Differences

Given the interest in differences between the OHST and the Loss Control Specialist, an additional statistical analysis was conducted on the validation ratings of the two groups. Mean differences in ratings of Importance, Criticality, and Frequency were compared using t-tests in order to detect differences of statistical significance. These results are presented below. Statistically significant differences were found in Domains II and IV for ratings of Importance and Frequency. However, it is important to note that statistical differences do not necessarily translate into practical differences. For example, test specifications based on only ratings provided by OHSTs would be similar to a test blueprint developed from ratings provided by Loss Control Specialists, despite these findings of statistical significance.

Domain	IMPORTANCE						
	OHST Sample Size (N)	OHST Mean	OHST Standard Deviation	LCS Sample Size (N)	LCS Mean	LCS Standard Deviation	t
I. Worksite Assessment	227	4.32	0.823	102	4.38	0.690	-0.697
II. Hazard Control and Loss Prevention	227	4.18	0.846	102	4.43	0.637	-2.672*
III. Verification	225	3.32	0.919	102	3.52	0.920	-1.778
IV. Disaster Planning and Emergency Response	227	3.11	1.062	102	2.73	0.997	3.131*
V. Professional Responsibility	226	4.18	0.959	102	0.96	4.096	0.774

* = $p < .05$

Domain	CRITICALITY						
	OHST Sample Size (N)	OHST Mean	OHST Standard Deviation	LCS Sample Size (N)	LCS Mean	LCS Standard Deviation	t
I. Worksite Assessment	227	4.08	0.832	94	4.04	0.789	0.365
II. Hazard Control and Loss Prevention	227	4.15	0.790	94	4.17	0.728	-0.216
III. Verification	226	3.18	0.945	94	3.23	0.966	-0.489
IV. Disaster Planning and Emergency Response	227	3.58	1.055	94	3.49	1.124	0.665
V. Professional Responsibility	226	3.35	1.078	94	3.41	1.121	-0.455

Domain	FREQUENCY						
	OHST Sample Size (N)	OHST Mean	OHST Standard Deviation	LCS Sample Size (N)	LCS Mean	LCS Standard Deviation	t
I. Worksite Assessment	210	32.91	14.347	90	31.70	10.918	.716
II. Hazard Control and Loss Prevention	210	27.75	12.285	90	32.94	11.896	-3.386*
III. Verification	210	14.25	8.719	90	14.31	6.765	-.062
IV. Disaster Planning and Emergency Response	210	11.30	6.630	90	9.28	6.458	2.440*
V. Professional Responsibility	210	13.79	9.621	90	11.77	7.153	1.794

* = $p < .05$

Reliability Analysis of Domain Scales

The reliability of the scales was assessed in order to determine how consistently the tasks measured the domain of interest. Reliability refers to the degree to which tests or surveys are free from measurement error. Imagine a scale measuring an individual's weight 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 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 respondents' ratings of Importance, Criticality, and Frequency for each domain. This calculates the extent to which each task rating within each domain consistently measures what other tasks within that 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. As shown below, all domains easily exceed this critical value.

RELIABILITY			
Domain	Importance	Criticality	Frequency
I	0.8493	0.7803	0.7797
II	0.8862	0.8642	0.8367
III	0.9441	0.9404	0.9524
IV	0.9229	0.9241	0.9261
V	0.8389	0.8629	0.8042

Summary of Results

As shown in the charts on the preceding pages, the survey respondents indicated that all domains are important. Each of the three domains has an average importance of at least 2.99 on the 5-point rating scale, with 2 being Somewhat Important and 3 being Important.

Similarly, the respondents considered all the domains to be critical. Each of the three domains has an average criticality rating of at least 3.19 on the 5-point scale, which means that incompetent performance of tasks in each domain could result in Moderate to Significant harm to the client, the Occupational Health and Safety Technologist, the Loss Control Specialist, the public, etc.

The survey respondents indicated they spend an uneven amount of time performing duties in the five domains. They indicated they spend most time (32.64%) performing duties in Domain I (Worksite Assessment) followed by Domain II (Hazard Control and Loss Prevention) at 29.31%. The least (10.64%) amount of time was spent in Domain IV (Disaster Planning and Emergency Response).

The order in which the domains were ranked by importance and criticality is somewhat different from the order in which the domains were ranked for frequency. While the respondents considered Domain I (Worksite Assessment) and Domain II (Hazard Control and Loss Prevention) to be the two most important, critical, and frequently performed domains, there were also differences in the rankings. Although Domain III (Verification) was ranked as the third most frequently performed domain, it was also ranked as the least critical. This finding suggests that the frequency with which an OHST or Loss Control Specialist performs a task does not necessarily correlate with that task's importance or criticality. In other words, a task that is performed very frequently may not be considered very important and/or critical. This outcome affects the weight that is assigned to that domain in the examination blueprint.

One of the important questions in the analysis concerned whether or not there were meaningful differences in the way that OHSTs and Loss Control Specialists from the insurance industry view their roles and responsibilities. Survey data include reasonable representation from both groups, yet comparisons of ratings between the two groups suggests no meaningful differences.

Conclusion

The results of the survey validate the results of the role delineation panel. This conclusion means that the domains, tasks, knowledge, and skills developed by the role delineation panel constitute an accurate definition of the work of a Credentialed OHST and Loss Control Specialist. Based on a psychometric analysis of the tasks, knowledge, and skills identified by the role delineation study, competence in Occupational Health and Safety Technologist can be assessed using a multiple-choice examination format.

PHASE III TEST SPECIFICATIONS

The final phase of a role delineation study is the development of test specifications that identify the proportion of questions from each domain and 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 scored questions related to each domain and task that should appear on the multiple-choice format examination.

The test blueprint was adjusted so that two percent of the test was distributed to Domain V (Professional Responsibility). The recommendation to make this change was based on the following:

- The ethical, disciplinary, and continuing competence requirements for certification and certification renewal provide the meaningful assurance to stakeholders.
- Other CCHEST test blueprints account for Professional Responsibility in similar manners.
- The change permits CCHEST to give greater emphasis to technical domains on the examination.

Therefore, the recommended test blueprint is shown below.

Domain	TEST BLUEPRINT	
	% of Test	# of Items on Test
I. Worksite Assessment	33.73	59
II. Hazard Control and Loss Prevention	31.01	54
III. Verification	17.14	30
IV. Disaster Planning and Emergency Response	14.11	25
V. Professional Responsibility	4.01	7

DOMAINS, TASKS, AND KNOWLEDGE AND SKILL STATEMENTS

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

Domain I.	Worksite Assessment
Domain II.	Hazard Control and Loss Prevention
Domain III.	Verification
Domain IV.	Disaster Planning and Emergency Response
Domain V.	Professional Responsibility

Performance Domain I Worksite Assessment

Evaluation and Allocation of Questions for Domain I.

Task	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
1	3.75	3.08	3.87	7.96	14
2	3.88	3.23	3.80	8.12	14
3	4.14	3.64	4.03	8.79	15
4	4.29	3.65	3.96	8.86	16
TOTAL				33.73	59

Tasks and Knowledge and Skill Statements for Domain I

Task 1: Research information pertaining to the business or operation using appropriate tools and references (e.g., World Wide Web; federal and state regulations; consensus standards; and insurance loss control references) to obtain general risk data.

Knowledge of:

1. World Wide Web
2. Internet search techniques
3. Computer databases
4. Insurance and loss control references
5. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)

6. Standard certifications and approvals (e.g., ANSI, ASTM, NIOSH, NFPA, and API)
7. Basic biological sciences, including toxicology and ergonomics

Skill in:

1. Using computers and software packages
2. Using Internet search engines
3. Using basic research techniques

Task 2: Evaluate actual business and operations data (e.g., monitoring and surveillance data; OSHA logs; incident reports; safety and health programs; and insurance loss data) by comparing the data against internal history as well as national or industry standards in order to recognize and define risks.

Knowledge of:

1. Benchmark standards (e.g., TLV and PEL)
2. Acceptable ratios (e.g., loss ratios, incident rates, and accident rates)
3. Data sampling procedures
4. Business terminology (e.g., financial terms)
5. Basic mathematics (e.g., algebra and ratios)
6. Spreadsheet, word processor, and database software

Skill in:

1. Analytical thinking (comparisons)
2. Communicating through talking and writing
3. Using computers and software packages

Task 3: Conduct surveys of the business or operation in accordance with accepted survey methodology (e.g., observing the facility; referring to process flow charts; verifying safety and health systems; programs and documentation; and interviewing employees and management) in order to recognize hazards and controls.

Knowledge of:

1. Properties of hazardous materials (e.g., basic chemistry and MSDSs)
2. Basic machine-guarding techniques
3. Survey techniques (e.g., checklist, flow chart, and interviewing techniques)
4. Basic building design and construction (e.g., blueprints and major systems)
5. Behavioral science, including human factors
6. Sampling techniques (e.g., air sampling and noise monitoring)
7. Fire prevention and suppression equipment
8. Safety and health regulations and best practices
9. Life safety standards
10. Basic biological sciences, including toxicology and ergonomics

Skill in:

1. Conducting interviews
2. Calibrating test equipment
3. Surveying facilities and operations

4. Reading blueprints
5. Measuring building dimensions
6. Computing sample sizes and interpreting data

Task 4: Communicate the results of surveys to management with appropriate documentation in order to educate management about risks and to recommend and justify appropriate actions for managing current and potential loss scenarios.

Knowledge of:

1. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)
2. Basic cost-benefit analysis
3. Organizational types and structures
4. Typical communication channels

Skill in:

1. Communicating through talking and writing
2. Interpreting regulations
3. Operating within the corporate environment

**Performance Domain II
Hazard Control and Loss Prevention**

RATINGS					
Task	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
1	3.99	3.67	3.89	7.59	13
2	4.10	3.83	3.89	7.76	14
3	4.26	3.94	4.07	8.07	14
4	3.94	3.71	3.90	7.59	13
			TOTAL	31.01	54

Task 1: Evaluate risks using established analytical techniques in order to prioritize corrective actions.

Knowledge of:

1. Formulas (e.g., mathematical, scientific, and statistical)
2. Problem solving techniques
3. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)
4. Industry standards and best practices
5. Internal standards
6. Basic biological sciences, including toxicology and ergonomics
7. Basic life and physical sciences
8. Basic health concepts

Skill in:

1. Interpreting exposure limits
2. Reading MSDSs
3. Thinking critically

Task 2: Select hazard control measures by reviewing available options and choosing the most appropriate in order to manage risk.

Knowledge of:

1. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)
2. Industry standards and best practices
3. Industrial processes
4. Administrative controls
5. Personal protective equipment
6. Engineering controls
7. Hierarchy of controls
8. Basic ventilation
9. Basic machine guarding techniques
10. Basic life and physical sciences

11. Basic engineering concepts
12. Basic ventilation measurement

Skill in:

1. Selecting personal protective equipment
2. Thinking critically

Task 3: Communicate the identified hazard control measures (e.g., recommend engineering, administrative, and PPE controls) by identifying essential resources and implementation strategies in order to manage risk.

Knowledge of:

1. Organizational types and structures
2. Strategies for prioritization of risks, hazard control measures, etc.
3. Necessary financial resources
4. Basic cost-benefit analysis
5. Basic financial terminology
6. Safety and health programs

Skill in:

1. Communicating through talking and writing
2. Negotiating
3. Presenting
4. Teaching

Task 4: Assist with the implementation of controls as appropriate (e.g., organize committees; plan, conduct or provide training; maintain records; collect data; collaborate with contractors; select equipment; and manage respirator, confined space entry, lock out/tag out, and other safety and health programs) in order to manage risk.

Knowledge of:

1. OSHA record keeping
2. Safety and health programs
3. Protocols for the calibration, maintenance, and use of sampling/monitoring equipment
4. Effective training solutions
5. Industry standards

Skill in:

1. Organizing
2. Managing projects
3. Interpreting analytical data
4. Influencing and persuading others
5. Training
6. Researching and gaining access to documents
7. Calibrating, maintaining, and using sampling/monitoring equipment

Performance Domain III Verification

RATINGS					
Task	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
1	3.99	3.66	3.84	5.78	10
2	4.20	3.87	3.93	6.03	11
3	3.71	3.31	3.59	5.33	9
TOTAL				17.14	30

Task 1: Verify that recommended hazard controls are implemented using management and evaluation techniques (e.g., site surveys, review of records, audits, interviews with key personnel, and follow-up with the responsible individuals) in order to ensure risks are adequately managed.

Knowledge of:

1. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)
2. Standard certifications and approvals (e.g., ANSI, ASTM, NIOSH, NFPA, and API)
3. Industry standards and best practices
4. Properties of hazardous materials (e.g., basic chemistry and MSDSs)
5. Behavioral science, including human factors
6. Material Safety Data Sheets
7. Basic life and physical sciences
8. Organizational types and structures
9. Types of and methods for conducting audits (e.g., internal and regulatory)

Skill in:

1. Conducting interviews
2. Listening actively
3. Using computers and software packages
4. Conducting verification audits and site surveys
5. Communicating through talking and writing

Task 2: Investigate incidents, accidents, and near misses using established techniques in order to determine root causes and formulate or update corrective action plans.

Knowledge of:

1. Basic elements of risk analysis (e.g., failure mode and effects analysis, fault-tree analysis, and root-cause analysis)
2. Federal OSHA techniques for computing incidence rates
3. Hazard controls (e.g., engineering controls, administrative controls, and PPE)
4. Investigative techniques

5. Basic life and physical sciences
6. Basic mathematics (e.g., algebra and ratios)

Skill in:

1. Computing incidence rates using federal OSHA techniques
2. Conducting interviews
3. Listening actively
4. Communicating through talking and writing

Task 3: Assess the effectiveness of specified hazard controls by analyzing performance data (e.g., records, loss data, incident rates, environmental samples, and incident reports) in order to ensure risks are adequately managed.

Knowledge of:

1. Industrial hygiene sampling techniques
2. Industry (e.g., NAISS, BLS) incident rates
3. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)
4. Standard certifications and approvals (e.g., ANSI, ASTM, NIOSH, NFPA, and API)
5. Types of medical surveillance
6. Basic life and physical sciences
7. Basic statistics

Skill in:

1. Using sampling protocols
2. Calibrating, maintaining, and using sampling/monitoring equipment
3. Computing sampling volumes
4. Computing and interpreting statistical analyses

**Performance Domain IV
Disaster Planning and Emergency Response**

RATINGS					
Task	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
1	3.61	3.82	3.06	2.49	5
2	3.26	3.35	2.90	2.26	4
3	3.53	3.58	2.96	2.39	4
4	3.47	3.41	2.97	2.33	4
5	3.45	3.35	3.09	2.34	4
6	3.42	3.32	2.97	2.30	4
			TOTAL	14.11	25

Task 1: Identify catastrophic and emergency response scenarios (e.g., fires/explosions, natural disasters, chemical releases, terrorism, and medical emergencies) using established techniques in order to anticipate risks.

Knowledge of:

1. Consensus standards (e.g., NFPA)
2. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)
3. Material Safety Data Sheets
4. Modeling development
5. Local, regional, and federal resources (e.g., civil defense, FEMA, local fire and police, medical facilities)
6. Characteristics of emergencies and natural disasters
7. Behavioral science, including human factors
8. System failures
9. Prior analyses conducted at the facility
10. Physical and electronic security

Skill in:

1. Basic modeling
2. Performing basic risk assessments
3. Identifying risk

Task 2: Evaluate scenarios using established techniques in order to characterize the probability and severity of occurrence.

Knowledge of:

1. Basic risk assessment

2. Basic cost-benefit analysis
3. Organizational types and structures
4. Basic mathematics (e.g., algebra and ratios)
5. Basic life and physical sciences

Skill in:

1. Computing cost-benefit analysis
2. Using statistical analytical techniques
3. Using qualitative analytical techniques

Task 3: Develop response plans for scenarios by reviewing available options, selecting viable strategies, and documenting action plans in order to ensure appropriate response to disasters and other emergencies.

Knowledge of:

1. Basic fire science
2. Behavioral science, including human factors
3. Basic life and physical sciences
4. Basic mathematics (e.g., algebra and ratios)
5. Properties of hazardous materials (e.g., basic chemistry and MSDSs)
6. Common methods of terrorism
7. Emergency equipment and supplies
8. Community response plans
9. Regulations (e.g., Incident Command System)

Skill in:

1. Communicating through talking and writing
2. Planning and developing disaster plans and emergency response

Task 4: Recommend administrative and engineering strategies for scenarios through communication with management in order to justify appropriate actions for managing responses to disasters and other emergencies.

Knowledge of:

1. Characteristics of emergencies and natural disasters
2. Basic risk assessment
3. Administrative and engineering disaster response strategies
4. Basic life and physical sciences
5. Mutual aid agreements
6. Organizational types and structures

Skill in:

1. Communicating through talking and writing
2. Facilitating team process

Task 5: Assist with the implementation of assigned responsibilities for response plans as appropriate (e.g., organize committees, provide training, collaborate with contractors,

select equipment, and manage specific programs) in order to ensure appropriate response to disasters and other emergencies.

Knowledge of:

1. Behavioral science, including human factors
2. Adult learning principles
3. Available emergency equipment
4. Regulatory and consensus standards (e.g., EPA and OSHA)
5. Community response plans

Skill in:

1. Communicating through talking and writing
2. Facilitating committees
3. Training diverse populations

Task 6: Evaluate the currency and effectiveness of response plans at regularly scheduled intervals by reviewing their applicability for present and emerging conditions (e.g., changes in organizational structure, and new processes or materials) in order to update the plans and ensure appropriate response to disasters and other emergencies.

Knowledge of:

1. Procedure, process, and equipment evaluation
2. Evaluation of training methods (e.g., exercises, practice drills, and surveys)
3. Emergency equipment inspection and required performance tests
4. Federal, state, and local regulations (e.g., FDA, OSHA, EPA, and DOT)

Skill in:

1. Using qualitative analytical techniques
2. Inspecting and using emergency equipment
3. Training diverse populations
4. Conducting and evaluating exercises, drills, and surveys

**Performance Domain V
Professional Responsibility**

RATINGS					
Task	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
1	4.28	3.59	3.94	1.39	3
2	3.86	3.23	3.51	1.24	2
3	4.33	3.35	3.99	1.37	2
TOTAL				4.01	7

Task 1: Health and Safety Technician/Technologist Code of Ethics.

Task 2: OHST disciplinary standards and procedures

Task 3: Professional development

Appendix A: Role Delineation Panel Participants

Roger Brauer
Savoy, IL

Robert Wayne Clifton, MA, CSP, PE, ALCM,
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Philadelphia, PA

Russell E. Dronne, CSP, CPCU, ALCM,
ARM
Warren, NJ

Ann Flannery, ALCM, CPCU
Bloomington, IL

Thea Hockstadt
Downers Grove, IL

Patrick E. Marcotte
Long Grove, IL

John Moore, OHST
Roxana, IL

Judy Morris, MS, RN, COHN-S/CM
Lowell, MI

Perry Pastir, CSP
Minneapolis, MN

Steven Schoolcraft, CSP, PE
Savoy, IL

Kenneth Sheffield
Marietta, GA

Rock Spraggins, CSP, MS
Hurst, TX

David Waggamon, CPCU, CSP, CIC, ALCM
Atlanta, GA

Gerry Walsh, OHST
Fort Worth, TX

Robert Walter, OHST
Massillon, OH

Phillip Watkins, OHST, EMT
New Orleans, LA

Timothy Weist, OHST, CHSP, BEAL
Elk Grove, IL

Appendix B: Other Credentials

AAM	CRSP, ROHT, CHRP
AHES	CSHM (3)
APA, CIPA	CSP construction
ARM	CSP specialty in construction
ASCS	CUSA-certified utility safety associate
ASP(17)	CUSA(6)
ASP/CSS	EIT
Associate of science	FFI
AU	Field safety rep, AR, TX, MS
Bachelor of science	Field Safety Representative
CAOHC	Formerly CIHT
CET(3)	IHIT
CET (NETA)	IHIT (RET)
CFPS-NFPA	None
CFPS, CET	None at present
CHCM Certified Hazard Control Manager	NRCC-CHO
CHSP	NRRT
CIE-certified indoor environmentalist	NYS DOL Safety Consultant and more.
CIH	OHC
CIH, CUSA	PE
CIHT	PE Safety
CMSP	PHIC
COHN-S (2)	REHS, CFSP, RS
COHN-S, NREMT-P	REM (2)
COHN-S/CM	REM, CEA, REPA
COHN, CUSA	RIHT
CPEA-certified professional environmental auditor	ROHT
CPEA (2)	ROHT/Canadian
CPHI(C), ROHT, CHSP, CHCM, CRSP, and CSA	SPHR
CPHRM	State of FL "OSHA-7"
CRM certified risk manager	STS (3)
	TWC-FSR field safety rep.
	WSO/CSE

Appendix C: Other Employers' Businesses

2834 R & D	Oil and gas
Aerospace	Pharmaceutical
Asbestos consultant agency	Pharmaceutical research/development & mfging
Communications	Pharmaceuticals
Consultant (2)	Pipeline transportation
Consulting (6)	Prime Contractor to Dept. of Energy
Contractor for dept. of energy	Environmental Restoration.
Distribution center-wholesale	Professional services
Education (5)	Public utility-natural gas
Electric & gas utility	R & D for manufacturing
Electric utility (2)	Radiological safety/demolition
Electrical utility	Recycling/refining
Engineering consultant	Research (2)
ENV consultation	Roofing association
ENV/IH consultant	Safety consultant
Environmental Eng./Remediation	Safety consulting
Financial Services	Service
Full service environmental	Telecommunication
Hazardous remediation	Textiles
Hazardous waste/radiological waste site remediation	Training
Marine	Training, Development, Consulting
Metallurgical Plants	U.S. Air Force
Military government contractor	Unemployed
Mining-surface metal-non-metal	University (2)
Nuclear (2)	USAF
Nuclear (electric)	Utility-generation
Nuclear products div	Utility (5)
of electric power generation	Waste-to-energy
Oil & gas drilling & production	We provide safety training & inspections

Appendix D: Experience in Other Industries

Aircraft Maintenance	Military (2)
Alternative fuel research	Military industrial facilities
Asbestos and lead	Military weapons systems and underground nuclear and non-nuclear weapons testing.
Chemical R & D	Natural gas distribution
Coal mining	Nuclear (3)
Communications	Nuclear (electric)
Consulting (4)	Nuclear energy and clean up
Defense	OCC Health/Env. Surveillance/Radiation Safety
Education (2)	Of electric power generation
Electric utility (5)	Oil & gas drilling & production
Emergency services- fire/EMS	Oil and gas
Environmental	Outdoor Natural Safety Resources Agency.
Environmental consulting	Petroleum exploration & production
Environmental Emergency Response/Hazmat	Pharmaceutical
Environmental Restoration (2)	Pharmaceutical research & development
Federal Government (Canada)	Pharmaceuticals
General industry-education	Pipeline transportation
General industry	Professional services
Government-OSHA 7(c) (1) program	R & D
Government (5)	Radiation safety
Government defense contracts (chemical)	Same as #7
Government entity risk	Telecommunications (4)
Governmental-natural resources	University & manufacturing
Governmental	US postal service
Hazardous remediation	USAF (2)
Health & safety over site for government contracts	USAF occupational health/environmental
Industrial maintenance	Utility (4)
Laboratory	
Metallurgical Plants, i.e. smelter, milling	

Appendix E: Survey

Instructions for Completing the Council on Certification of Health, Environmental and Safety Technologists (CCHESST) Role Delineation Survey for the Occupational Health and Safety Technologist (OHST)

This booklet contains the Council on Certification of Health, Environmental and Safety Technologists (CCHESST) Occupational Health and Safety Technologist (OHST) Role Delineation Survey, along with instructional materials to aid you in completing it. Directions are provided at the beginning of each section of the survey.

In **Section A**, you are asked to complete a **Confidential Survey**, which provides us with the demographic information necessary to ensure that safety and loss control practitioners working in various settings with differing backgrounds are represented in the data collection.

In **Section B**, we have provided you with a list of definitions and terms that are used throughout the survey. We suggest that you review the **Definition of Terms** before responding to any survey questions.

In **Section C**, you are asked to review the **Domains** that define the duties of an OHST or loss control practitioner. We ask that you rate the importance, criticality, and frequency of these domains as they pertain to the minimally competent OHST or entry-level loss control practitioner.

In **Section D**, you are asked to review the **Task Statements** required for competent performance in each domain, and then rate each for importance, criticality, and frequency.

Please review the entire booklet before responding to any of the questions. Your review will help you to understand our terminology and the structure of the Role Delineation Survey.

Please mark your responses directly in this booklet. We will collect all of the surveys and use your responses to help determine the blueprint for the CCHESST OHST examination. Please return your completed survey by **November 25, 2002**, in the enclosed, self-addressed, stamped envelope to:

**CASTLE Worldwide, Inc.
Post Office Box 14148
Research Triangle Park, North Carolina 27709-4148**

Thank you in advance for your help with this very important project.

Section A Confidential Survey

Please fill in the following demographic information, which will be used to ensure that safety and loss control practitioners working in various settings with differing backgrounds are represented in the data collection.

All responses are kept strictly confidential by CASTLE Worldwide, Inc. Computer programs are used to sort the data. No individual person or company, or the particular data of either, will be identifiable in any report generated using information obtained through this survey.

Please check the appropriate boxes, or print your responses.

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/province do you live? _____

4. How would you describe your position? *(Check only one.)*

Occupational Health and Safety
Technologist (OHST)

Loss Control Practitioner

5. How many years have you worked as an OHST or loss control practitioner? *(Check only one.)*

Less than 2 years

6-10 years

16-20 years

2-5 years

11-15 years

More than 20 years

6. Which of the following credentials do you hold? *(Select all that apply.)*

ALCM

CHST

OHST

ARM

CPCU

Other *(Please specify.)*

CHMM

CSP

7. Please select the **best** description for your employer's business from the list below. (*Check only one.*)

- | | |
|--|---|
| <input type="checkbox"/> Construction | <input type="checkbox"/> Petrochemical |
| <input type="checkbox"/> Governmental | <input type="checkbox"/> Retail |
| <input type="checkbox"/> Health Care | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Insurance | <input type="checkbox"/> Retired |
| <input type="checkbox"/> Manufacturing | <input type="checkbox"/> Other (<i>Please specify.</i>) |
-

8. How many employees are in the health and safety or loss control department at your facility? (*Check only one.*)

- | | | |
|--|--|---|
| <input type="checkbox"/> 0-2 employees | <input type="checkbox"/> 6-10 employees | <input type="checkbox"/> 16-20 employees |
| <input type="checkbox"/> 3-5 employees | <input type="checkbox"/> 11-15 employees | <input type="checkbox"/> More than 20 employees |

9. What percentage of time do you spend working in health and safety or loss control? (*Check only one.*)

- | | | |
|--|--|---|
| <input type="checkbox"/> 0-20 percent | <input type="checkbox"/> 40-60 percent | <input type="checkbox"/> 80-100 percent |
| <input type="checkbox"/> 20-40 percent | <input type="checkbox"/> 60-80 percent | |

10. What is your **highest** level of education? (*Check only one.*)

- | | |
|--|--|
| <input type="checkbox"/> High school diploma/GED | <input type="checkbox"/> Bachelor's Degree |
| <input type="checkbox"/> Some college courses | <input type="checkbox"/> Master's Degree |
| <input type="checkbox"/> Associate Degree | <input type="checkbox"/> Doctorate |

11. In which industry do you have the most experience as an OHST or loss control practitioner? (*Check only one.*)

- | | |
|--|---|
| <input type="checkbox"/> Construction | <input type="checkbox"/> Petrochemical |
| <input type="checkbox"/> Health Care | <input type="checkbox"/> Retail |
| <input type="checkbox"/> Insurance | <input type="checkbox"/> Transportation |
| <input type="checkbox"/> Manufacturing | <input type="checkbox"/> Other (<i>Please specify.</i>) |
-

Section B Definition of Terms

Below are definitions of the terms found in this Role Delineation Survey.

Occupational Health and Safety Technologist (OHST): An OHST must have five years of experience in health and safety. (Academic education beyond a high school diploma may be used to substitute for experience.) An OHST must perform duties that require technical knowledge and skills in health and safety. An OHST may work part-time or full-time in health and safety, with a minimum workload of 35 percent of his or her time.

Performance Domain: The performance domains are the major responsibilities or duties that define the role of the OHST or loss control practitioner. Each performance domain may be considered a major heading in an outline and may include a brief behavioral description. There are five performance domains included in this survey, as identified by an expert panel: Worksite Assessment; Hazard Control and Loss Prevention; Verification; Disaster Planning and Emergency Response; and Professional Responsibility.

Task Statement: A task is an activity performed within a performance domain. Each performance domain consists of a series of tasks that collectively form a comprehensive and detailed description of each performance domain. Typically, task statements answer such questions as: What activity did you perform? To whom or to what was your activity directed? Why did you perform that activity? How did you accomplish the activity?

Section C

Evaluation of Domain Statements

Instructions: You will be rating each performance domain identified by an expert panel on three dimensions: *Importance, Criticality, and Frequency*.

Importance: Importance is defined as the degree to which knowledge in the performance domain is essential to the job performance of a minimally competent OHST or entry-level loss control practitioner. Indicate how important each performance domain is to the performance of a minimally competent OHST or entry-level loss control practitioner. Rate each of the five performance domains by using the scale below. Please assign each performance domain **only one** rating. **DO NOT RANK THE DOMAINS.** Select the number of the description below that best exemplifies your rating for each performance domain and write that number in the space provided next to each performance domain.

- 1 = Not Important.** Performance of tasks in this domain is not essential to the job performance of the minimally competent OHST or entry-level loss control practitioner.
- 2 = Somewhat Important.** Performance of tasks in this domain is minimally essential to the job of the minimally competent OHST or entry-level loss control practitioner.
- 3 = Important.** Performance of tasks in this domain is moderately essential to the job of the minimally competent OHST or entry-level loss control practitioner.
- 4 = Very Important.** Performance of tasks in this domain is clearly essential to the job of the minimally competent OHST or entry-level loss control practitioner.
- 5 = Extremely Important.** Performance of tasks in this domain is absolutely essential to the job of the minimally competent OHST or entry-level loss control practitioner.

Rating of Importance	Performance Domain
_____	1. Worksite Assessment
_____	2. Hazard Control and Loss Prevention
_____	3. Verification
_____	4. Disaster Planning and Emergency Response
_____	5. Professional Responsibility

Criticality: *Criticality is defined as the degree to which adverse effects could result if the minimally competent OHST or entry-level loss control practitioner is not knowledgeable in the performance domain. Indicate the degree to which the inability to perform tasks within the performance domain would be seen as causing harm to a client, a co-worker, the public, the environment, etc. Harm may be physical, emotional, financial, etc. Rate each of the five performance domains by using the scale below. Please assign each performance domain only one rating. DO NOT RANK THE DOMAINS. Select the number of the description that best exemplifies your rating for each performance domain and write that number in the space provided next to each performance domain.*

- 1 = No Harm.** Inability to perform tasks within this performance domain would have no adverse consequences.
- 2 = Minimal Harm.** Inability to perform tasks within this performance domain would lead to error with minimal adverse consequences.
- 3 = Moderate Harm.** Inability to perform tasks within this performance domain would lead to error with moderate adverse consequences.
- 4 = Significant Harm.** Inability to perform tasks within this performance domain would lead to error with major adverse consequences.
- 5 = Extreme Harm.** Inability to perform tasks within this performance domain would definitely lead to error with catastrophic consequences.

Rating of Criticality	Performance Domain
_____	1. Worksite Assessment
_____	2. Hazard Control and Loss Prevention
_____	3. Verification
_____	4. Disaster Planning and Emergency Response
_____	5. Professional Responsibility

Frequency: *What percent of time does the minimally competent OHST or entry-level loss control practitioner spend performing duties or using the principles associated with each performance domain? Write the percentage in the space provided next to each domain. The total must equal 100 percent.*

Rating of Frequency	Performance Domain
_____	1. Worksite Assessment
_____	2. Hazard Control and Loss Prevention
_____	3. Verification
_____	4. Disaster Planning and Emergency Response
_____	5. Professional Responsibility
100%	TOTAL

Section D Evaluation of Task Statements

In this section you will rate the task statements associated with each of the five domains on three dimensions – *Importance, Criticality, and Frequency* – according to the scales below:

Rating Scales

Importance	Criticality*	Frequency
1 - Not important	1 - Causing no harm	1 – Never
2 - Somewhat important	2 - Causing minimal harm	2 – Rarely
3 - Important	3 - Causing moderate harm	3 – Infrequently
4 - Very important	4 - Causing significant harm	4 – Frequently
5 - Extremely important	5 - Causing extreme harm	5 – Repetitively

**the amount of harm that could be caused by performing the task incompetently*

Circle the number corresponding to the **Importance, Criticality, and Frequency** rating for each task statement.

Domain I: Worksite Assessment	Importance	Criticality	Frequency
Task 1: Research information pertaining to the business or operation using appropriate tools and references (e.g., World Wide Web; federal and state regulations; consensus standards; and insurance loss control references) to obtain general risk data.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 2: Evaluate actual business and operations data (e.g., monitoring and surveillance data; OSHA logs; incident reports; safety and health programs; and insurance loss data) by comparing the data against internal history as well as national or industry standards in order to recognize and define risks.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 3: Conduct surveys of the business or operation in accordance with accepted survey methodology (e.g., observing the facility; referring to process flow charts; verifying safety and health systems; programs and documentation; and interviewing employees and management) in order to recognize hazards and controls.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 4: Communicate the results of surveys to management with appropriate documentation in order to educate management about risks and to recommend and justify appropriate actions for managing current and potential loss scenarios.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Please list any tasks related to Domain I that you think may have been overlooked.

Rating Scales

Importance	Criticality*	Frequency
1 - Not important	1 - Causing no harm	1 – Never
2 - Somewhat important	2 - Causing minimal harm	2 – Rarely
3 - Important	3 - Causing moderate harm	3 – Infrequently
4 - Very important	4 - Causing significant harm	4 – Frequently
5 - Extremely important	5 - Causing extreme harm	5 – Repetitively

**the amount of harm that could be caused by performing the task incompetently*

Domain II: Hazard Control and Loss Prevention	Importance	Criticality	Frequency
Task 1: Evaluate risks using established analytical techniques in order to prioritize corrective actions.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 2: Select hazard control measures by reviewing available options and choosing the most appropriate in order to manage risk.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 3: Communicate the identified hazard control measures (e.g., recommend engineering, administrative, and PPE controls) by identifying essential resources and implementation strategies in order to manage risk.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 4: Assist with the implementation of controls as appropriate (e.g., organize committees; plan, conduct or provide training; maintain records; collect data; collaborate with contractors; select equipment; and manage respirator, confined space entry, lock out/tag out, and other safety and health programs) in order to manage risk.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Please list any tasks related to Domain II that you think may have been overlooked.

Domain III: Verification	Importance	Criticality	Frequency
Task 1: Verify that recommended hazard controls are implemented using management and evaluation techniques (e.g., site surveys, review of records, audits, interviews with key personnel, and follow up with the responsible individuals) in order to ensure risks are adequately managed.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 2: Investigate incidents, accidents, and near misses using established techniques in order to determine root causes and formulate or update corrective action plans.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 3: Assess the effectiveness of specified hazard controls by analyzing performance data (e.g., records, loss data, incident rates, environmental samples, and incident reports) in order to ensure risks are adequately managed.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Rating Scales

Importance	Criticality*	Frequency
1 - Not important	1 - Causing no harm	1 – Never
2 - Somewhat important	2 - Causing minimal harm	2 – Rarely
3 - Important	3 - Causing moderate harm	3 – Infrequently
4 - Very important	4 - Causing significant harm	4 – Frequently
5 - Extremely important	5 - Causing extreme harm	5 – Repetitively

**the amount of harm that could be caused by performing the task incompetently*

Please list any tasks related to Domain III that you think may have been overlooked.

Domain IV: Disaster Planning and Emergency Response	Importance	Criticality	Frequency
Task 1: Identify catastrophic and emergency response scenarios (e.g., fires/explosions, natural disasters, chemical releases, terrorism, and medical emergencies) using established techniques in order to anticipate risks.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 2: Evaluate scenarios using established techniques in order to characterize the probability and severity of occurrence.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 3: Develop response plans for scenarios by reviewing available options, selecting viable strategies, and documenting action plans in order to ensure appropriate response to disasters and other emergencies.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 4: Recommend administrative and engineering strategies for scenarios through communication with management in order to justify appropriate actions for managing responses to disasters and other emergencies.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 5: Assist with the implementation of assigned responsibilities for response plans as appropriate (e.g., organize committees, provide training, collaborate with contractors, select equipment, and manage specific programs) in order to ensure appropriate response to disasters and other emergencies.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 6: Evaluate the currency and effectiveness of response plans at regularly scheduled intervals by reviewing their applicability for present and emerging conditions (e.g., changes in organizational structure, and new processes or materials) in order to update the plans and ensure appropriate response to disasters and other emergencies.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Rating Scales

Importance	Criticality*	Frequency
1 - Not important	1 - Causing no harm	1 – Never
2 - Somewhat important	2 - Causing minimal harm	2 – Rarely
3 - Important	3 - Causing moderate harm	3 – Infrequently
4 - Very important	4 - Causing significant harm	4 – Frequently
5 - Extremely important	5 - Causing extreme harm	5 – Repetitively

**the amount of harm that could be caused by performing the task incompetently*

Please list any tasks related to Domain IV that you think may have been overlooked.

Domain V: Professional Responsibility	Importance	Criticality	Frequency
Task 1: Health and Safety Technician/Technologist Code of Ethics	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 2: OHST disciplinary standards and procedures	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Task 3: Professional development	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

Please list any tasks related to Domain V that you think may have been overlooked.

THIS CONCLUDES THE ROLE DELINEATION SURVEY.

THANK YOU FOR YOUR VALUABLE INPUT.

PLEASE RETURN THIS SURVEY BY NOVEMBER 25, 2002

IN THE ENCLOSED, POSTAGE-PAID ENVELOPE.

CCHEST CERTIFICATION MAINTENANCE POINT

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