

**ROLE DELINEATION STUDY
FOR**

**Safety Trained Supervisor[®] in
Petrochemical Examinations**

**CCHEST Technical Report 2004-2
March 2004**



**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 Safety Trained Supervisor[®] in General Industry (STS-Petrochemical) role delineation study and the results obtained from this study. The Council on Certification of Health, Environmental and Safety Technologists (CCHEST) commissioned this role delineation study to develop the examination blueprint for the STS-Petrochemical examination. CCHEST will use this examination to evaluate the safety- and health-related knowledge and skills of supervisors working in general industry prior to awarding them the STS-Petrochemical 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.

CCHEST will start the STS-Petrochemical designation in mid-2004. To ensure the validity of the examination leading to this certification, CCHEST 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 supervisors in general industry. The results from this validity study provide the basis for the STS-Petrochemical examination blueprint.

CCHEST commissioned this study in 2003, and it was completed in 2004. The CCHEST Board of Directors evaluated the results of this study and approved the final examination blueprint in March 2004. Once approved, item banks were generated to prepare for deploying the new STS-Petrochemical examination.

The current trend in role delineation studies is to define the roles of the certified population along with the applicable knowledge and skills necessary for carrying out the roles. Like the study performed for the STS-Construction examination, this role delineation study followed procedures that resulted in a function-based examination blueprint. In conducting this study, CCHEST relied on the psychometric staff of CASTLE Worldwide to conduct most of the tasks necessary to complete the study. CCHEST is especially grateful to the safety practitioners 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 the roles performed by STS-Petrochemical certificate holders and the knowledge and skills necessary for certificate holders to perform these roles. The second phase involved validating the information from the first phase using a survey process completed by a sample of practitioners in the field of general industry supervision. The last phase of the role delineation study was the actual development of the test specification from the ratings obtained from the survey responses acquired in the second phase. Additional details on the methodology used for this study is found in Appendix A.

Phase 1. Initial Development and Validation

CCHEST selected a panel of seven experts in safety practice (Appendix A) to participate in a two-day workshop conducted in Houston, Texas in August 2003. The panel represented a variety of practices and geographic regions. A senior psychometrician from CASTLE Worldwide led the workshop. The group defined the major roles (tasks) necessary for competence as an STS-Petrochemical certificate holder.

The group then developed the knowledge certificants 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. 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 practitioners.

Phase 2. Validation Study

To conduct this phase, CASTLE Worldwide and CCHEST developed a survey instrument (Appendix A) to validate the work of the seven member expert panel convened in Phase 1. The survey first asked several questions relating to the respondents' demographic data to verify that a representative cross-section of the practice was obtained. The survey then asked the respondents to evaluate the task statements proposed by the seven 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.

Since the STS-Petrochemical program is new, the survey could not be sent to an existing pool of certificants. The survey instrument was sent to 10 practitioners in the area of petrochemical supervision, and 11 useable responses were returned (one survey respondent received permission from CCHEST to distribute the survey to a colleague). The data from the surveys were then used to develop the test specification in Phase 3.

Phase 3. Development of Test Specifications

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

Table 1. STS-Petrochemical and Examination Specification

<p>Task 1 (11.4%)</p> <p>Conduct job safety analyses by performing pre-task hazard analyses, and by evaluating personal protective equipment, tools, equipment, and job expectations in order to identify potential hazards and reduce the risk of incident or injury.</p>	
<p>Knowledge</p> <ol style="list-style-type: none"> 1. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tool needed 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Limitations of personal protective equipment 4. Requirements for the selection of personal protective equipment 5. Principles and applications of hazard control 6. Safety resources (e.g., material safety data sheets, key personnel, experts) 7. Documentation of job safety analyses and procedures derived from the analyses 8. Basic mathematics 	<p>Skills</p> <ol style="list-style-type: none"> 1. Recognizing hazards and mitigating exposure 2. Facilitating job safety analyses (identifying job steps) 3. Communicating the purpose and effectiveness of job safety analyses 4. Selecting, using, and maintaining personal protective equipment 5. Using safety resources 6. Using basic mathematical formulas
<p>Task 2 (6.7%)</p> <p>Verify that equipment and the facility are inspected in accordance with requirements in order to reduce the risk of loss.</p>	
<p>Knowledge</p> <ol style="list-style-type: none"> 1. Safety, health, and environmental management systems 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Process safety management requirements 4. Organizational policies and procedures 5. Manufacturers' requirements 	<p>Skills</p> <ol style="list-style-type: none"> 1. Surveying the worksite 2. Reviewing documentation (e.g., logbooks, tags)
<p>Task 3 (10.7%)</p> <p>Enforce safety and health rules and regulations within the work group by coaching and correcting observed deficiencies or by taking appropriate disciplinary action in order to reduce the risk of incident or injury.</p>	
<p>Knowledge</p> <ol style="list-style-type: none"> 1. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Coaching techniques 4. Conflict resolution techniques 5. Appropriate disciplinary policies and procedures 6. Applicable process safety management requirements 7. Specific topics: confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, hazardous waste operations and emergency response (HAZWOPER), personal protective equipment, handling compressed gases, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety 	<p>Skills</p> <ol style="list-style-type: none"> 1. Recognizing hazards and mitigating exposure 2. Coaching safe behaviors 3. Keeping records 4. Taking appropriate action when observing possible alcohol and other drug abuse at the work place
<p>Task 4 (8.4%)</p> <p>Take appropriate action when confronted with problems by exercising stop-work authority, modifying tasks, elevating issues, consulting with qualified professionals (when the matter is outside the scope of the supervisor's capabilities), etc., in order to maintain a safe and healthful work environment.</p>	
<p>Knowledge</p> <ol style="list-style-type: none"> 1. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Organizational structure for the organization (e.g., hierarchy, chain of command) 4. Organizational policies and procedures 5. Principles and applications of hazard control 6. Basic principles of risk assessment 	<p>Skills</p> <ol style="list-style-type: none"> 1. Exercising leadership 2. Making decisions 3. Communicating to employees effectively 4. Analyzing 5. Resolving conflicts 6. Recognizing and evaluating high risk problems

Table 1. STS-Petrochemical Blueprint and Examination Specification (continued)

<p>Task 5 (11.0%)</p> <p>Facilitate a positive, proactive safety culture by anticipating hazards, modeling and coaching safe behavior, promoting incident reporting, supporting employee participation, and communicating performance measures in order to enhance safety and health.</p>	
<p>Knowledge</p>	<p>Skills</p>
<ol style="list-style-type: none"> 1. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed 2. Characteristics of proactive safety cultures and reactive safety cultures 3. Industry-accepted performance measures (e.g., incidence rates) 4. Conflict resolution techniques 5. Principles and applications of hazard control (e.g., energy isolation, permitting) 6. Facilitation and safety communication strategies 7. Purpose and organization of safety meetings 8. Organizational management of change procedures 	<ol style="list-style-type: none"> 1. Distinguishing types of safety cultures 2. Coaching safe behaviors 3. Using observation to identify unsafe behaviors 4. Using open, clear, and interactive communication 5. Resolving conflicts 6. Using facilitation skills 7. Leading safety meetings 8. Communicating management of change procedures
<p>Task 6 (6.4%)</p> <p>Verify that work group employees are capable of performing work safely by reviewing their training records and job-specific qualifications in order to ensure competent staff.</p>	
<p>Knowledge</p>	<p>Skills</p>
<ol style="list-style-type: none"> 1. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Training and qualifications necessary for specific jobs and/or tasks 4. Organizational record keeping systems 5. Evidence of required training (e.g., DOT operator qualifications, hazardous waste operations and emergency response (HAZWOPER), confined spaces, process safety management operator qualifications, welding, crane operation) 6. Key personnel who are authorized to sign/issue permits 	<ol style="list-style-type: none"> 1. Assessing training needs based on requirements and hazards 2. Making decisions 3. Keeping records
<p>Task 7 (8.8%)</p> <p>Ensure that new personnel in the work area are oriented to safety, health, and environmental considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.</p>	
<p>Knowledge</p>	<p>Skills</p>
<ol style="list-style-type: none"> 1. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Emergency action plans and procedures 4. Specific topics: confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, hazardous waste operations and emergency response (HAZWOPER), personal protective equipment, handling compressed gases, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety 	<ol style="list-style-type: none"> 1. Using observation to identify unsafe behaviors 2. Using open, clear, and interactive communication

Table 1. STS-Petrochemical Blueprint and Examination Specification (continued)

<p>Task 8 (6.0%)</p> <p>Apply safety, health, and environmental-related record keeping as required by organizational policy and regulations using established procedures to document essential processes.</p>	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 2. Security and confidentiality requirements of record keeping processes 3. Ethical considerations concerning the accuracy of information, conflict of interests, etc. 4. Injury management/workers' compensation (working knowledge) 5. Specific process safety management record keeping requirements: process hazard analyses, process safety information, management of change, pre-start-up safety reviews, training, operations procedure verification, process hazard analysis revalidation, site access control 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Resolving ethical conflicts related to record keeping 2. Keeping records
<p>Task 9 (6.2%)</p> <p>Participate in employee evaluations by including safety, health, and environmental performance as a key criterion in order to hold employees accountable for safety.</p>	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Strategies for evaluating safety behavior, participation in safety culture, etc. 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Observation techniques 4. Organizational safety performance measures for employees 5. Techniques for safety performance recognition and reward or correction 6. Specific topics: confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, hazardous waste operations and emergency response (HAZWOPER), personal protective equipment, handling compressed gases, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Using observation to identify unsafe behaviors 2. Coaching safe behaviors 3. Communicating to employees effectively 4. Listening to concerns and suggestions 5. Implementing organizational and regulatory requirements 6. Implementing organizational performance measurement procedures 7. Comparing safety, health, and environmental performance to applicable standards 8. Evaluating employee performance regarding confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, hazardous waste operations and emergency response (HAZWOPER), personal protective equipment, handling compressed gases, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, and ionizing radiation safety
<p>Task 10 (7.9%)</p> <p>Participate in investigations that determine causes, identify corrective actions, and document lessons learned using recognized investigation techniques in order to reduce the risk of workplace incidents and address employee concerns.</p>	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Purpose and principles of accident/incident investigations 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Investigation techniques 4. Organizational record keeping systems 5. Principles and applications of hazard control 6. Lessons learned from incidents at the worksites 7. Organizational policies regarding communication with external entities 8. Ethical considerations concerning sources of data, accuracy of data, preservation of evidence, application of investigation techniques, reporting, etc. 9. Process safety management incident investigation requirements (e.g., timeliness, investigation team make up) 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Selecting correct investigation techniques 2. Accessing lessons learned at the worksite and in the industry 3. Applying investigation techniques correctly 4. Analyzing and protecting evidence 5. Communicating results 6. Resolving ethical conflicts 7. Applying requirements for confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, hazardous waste operations and emergency response (HAZWOPER), personal protective equipment, handling compressed gases, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, and ionizing radiation safety
<p>Task 11 (8.1%)</p> <p>Implement emergency action plans in accordance with the nature of incidents in order to minimize potential losses.</p>	
<p style="text-align: center;">Knowledge</p> <ol style="list-style-type: none"> 1. Emergency action plans 2. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices) 3. Emergency procedures 4. Terminology used in emergency action plans 5. Techniques for implementing exercises 6. Organizational record keeping requirements 	<p style="text-align: center;">Skills</p> <ol style="list-style-type: none"> 1. Recognizing the nature and severity of incidents 2. Determining actions needed 3. Communicating to employees effectively 4. Executing the emergency action plan 5. Facilitating post exercise/incident evaluations 6. Keeping records

Table 1. STS-Petrochemical Blueprint and Examination Specification (continued)

Task 12 (8.3%)	
Interact with other work group supervisors using timely communication to coordinate operations and work processes and to minimize risk.	
Knowledge	Skills
<ol style="list-style-type: none"> 1. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed 2. Leadership techniques 3. Facilitation techniques 4. Effective communication techniques (e.g., among shifts, simultaneous work groups, different levels of the hierarchy within the organization) 5. Principles and applications of hazard control 6. Organizational policies and procedures 7. Organizational record keeping requirements 8. Specific process safety management contractor requirements 	<ol style="list-style-type: none"> 1. Recognizing hazards and mitigating exposure 2. Making decisions 3. Using techniques for minimizing risk 4. Using open, clear, and interactive communication

CONCLUSIONS

1. The results of the survey validate the results of the role delineation panel. This conclusion means that the tasks and knowledge developed by the role delineation panel constitute an accurate definition of the work of a person certified as a Safety Trained Supervisor in Petrochemical.
2. 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.

APPENDIX A

CASTLE WORLDWIDE ROLE DELINEATION STUDY



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

**ROLE DELINEATION STUDY
SAFETY TRAINED SUPERVISOR – PETROCHEMICAL
(STS-PETROCHEMICAL)**

JANUARY 2004

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INTRODUCTION

On August 20-21, 2003, a panel of seven experts assembled by the Council on Certification of Health, Environmental and Safety Technologists (CCHEST) held a meeting with representatives from CASTLE Worldwide, Inc., (CASTLE) to delineate the field of Certified Safety Trained Supervisor in Petrochemical (STS-Petrochemical).

The major function of the CCHEST credentialing program is to ensure competency and professionalism in the field of safety-trained supervision. It provides assurance that the STS-Petrochemical certificate holder has met specific criteria designed to ensure that he or she is competent in the provision of services.

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

Before a content-valid examination is developed, the knowledge needed to be a competent practitioner 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 required to function as a competent practitioner in the field. A content-valid examination contains a representative sample of items that measure the knowledge contained in the practice being tested.

Thus, the role delineation study is an integral part of ensuring that an examination is content-valid in that the aspects of the practice 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 CCHEST consisted of the following three phases, which are the focus of this report:

- I. Initial Development and Validation. The seven-member role delineation panel identified the tasks and knowledge essential to the performance of an STS-Petrochemical.
- II. Validation Study. A representative sample of practitioners in the field of safety-trained supervision 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 practitioners, the test specifications for the certification examination were developed.

PHASE I INITIAL DEVELOPMENT AND EVALUATION

The first step in analyzing the practice of the STS-Petrochemical was the identification of the major content areas or tasks. This was followed by the identification of the knowledge and skill associated with each task.

In 2003, CCHESST assembled a seven-member panel of subject matter experts in the health and safety field to discuss the role of the STS-Petrochemical. (*See Appendix A: Role Delineation Meeting Participants.*) The panel members represented a variety of practice settings and geographic regions. The following steps were undertaken to complete Phase I:

- A. The panel determined that the practice could be divided into 12 major tasks. These tasks are:
1. Conduct job safety analyses by performing pre-task hazard analysis and by evaluating PPE, tools, equipment, and job expectations in order to identify potential hazards and reduce the risk of incident or injury.
 2. Verify that equipment and facility are inspected in accordance with requirements in order to reduce the risk of loss.
 3. Enforce safety, health, and environmental rules and regulations within the work group by coaching and correcting observed deficiencies or by taking appropriate disciplinary action in order to reduce the risk of incident or injury.
 4. Take appropriate action when confronted with problems by exercising stop-work authority, modifying tasks, elevating issues, consulting with qualified professionals (when the matter is outside the scope of the supervisor's capabilities), etc., in order to maintain a safe and healthful work environment.
 5. Facilitate a positive, pro-active safety culture by anticipating hazards, modeling and coaching safe behavior, promoting incident reporting, supporting employee participation, and communicating performance measures in order to enhance safety and health.
 6. Verify that work group employees are capable of performing work safely by reviewing their training records and job-specific qualifications in order to ensure competent staff.
 7. Ensure that new personnel in the work area are oriented to safety, health, and environmental considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.
 8. Perform safety, health, and environmental-related record keeping as required by company policy and regulations using established procedures to document essential processes.
 9. Participate in employee evaluation by including safety, health, and environmental performance as a key criterion in order to hold employees accountable for safety.
 10. Participate in investigations that determine causes, identify corrective actions, and document lessons learned using recognized investigation techniques in order to reduce the risk of workplace incidents and address employee concerns.
 11. Implement emergency action plans in accordance with the nature of incidents in order to minimize potential losses.
 12. Interact with other work group supervisors using timely communication to coordinate operations and work processes and to minimize risk.
- B. Next, the panel subsequently generated a list of knowledge and skills required to perform each task.
- C. The panel members then evaluated each performance task, rating each on importance and criticality to the STS-Petrochemical and the frequency with which the activities associated with each task are performed.

Based on the work of the role delineation panel, an eight-page survey was developed and sent to practitioners in the field of health and safety. (*See Appendix B: Role Delineation Survey.*) The results of the survey are the focus of Phase II.

**PHASE II
VALIDATION STUDY**

Questionnaire Design and Distribution

Using the tasks identified by the role delineation panel, CASTLE developed an eight-page survey to be completed by a nationwide sample of practitioners in the field of safety-trained supervision. CASTLE distributed the questionnaire to 10 practitioners to evaluate, validate, and provide feedback on the role delineation panel's task list. The survey also solicited biographical information from the respondents in order to ensure a representative response and completion by appropriately qualified individuals. Of the 10 questionnaires distributed, 11 usable responses were returned to CASTLE.

Who Responded to the Survey?

As shown in the chart below, the majority of respondents (10, or 90.9%) are male, with one (9.1%) female. Most of the respondents (10 or 90.9%) were above the age of 50. More than half (54.5%) reported that their current employers would be categorized as being involved in the "Manufacturing of Petrochemicals" and 63.63% reported supervising at least one employee. Because not all survey respondents answered every survey question, the total number of responses for each survey item might not equal the total number of surveys returned.

As reflected in the demographic data and graphs on the following pages, the survey respondents represent a diverse population from across the country.

Figure 1. Breakdown of Respondents' Gender

The vast majority of the respondents were male with only one individual, or 9.1% of the sample, reporting her gender as female.

GENDER		
	Frequency	Percent
Female	1	9.1
Male	10	90.9
Total	11	100.0

Figure 2. Breakdown of Respondents' Age

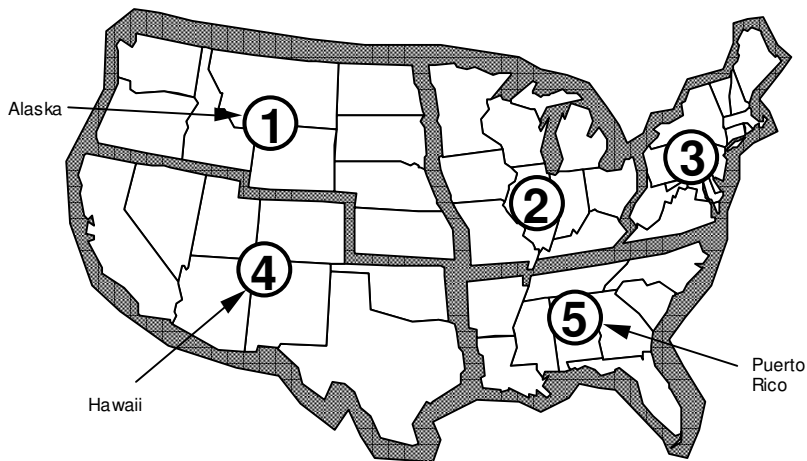
Almost three-fourths of the respondents were between 50 and 60 years old (72.7%). No individuals reported their age as less than 40 years old.

AGE		
	Frequency	Percent
Under 20 years	0	0.0
20-29 years	0	0.0
30-39 years	0	0.0
Total	0	0.0

AGE		
	Frequency	Percent
40-49 years	1	9.1
50-60 years	8	72.7
More than 60 years	2	18.2
Total	11	100.0

Figure 3. Breakdown of Respondents' Location

States were combined into regions as shown below. All respondents reported living in either Region 4 or 5.



LOCATION		
	Frequency	Percent
1	0	0.0
2	0	0.0
3	0	0.0
Total	0	0.0

LOCATION		
	Frequency	Percent
4	9	81.8
5	2	18.2
6 (Non-US)	0	0.0
Total	11	100.0

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

Respondents were asked to write in their current employer. Results are provided below.

CURRENT EMPLOYER	
	Frequency
ABS Consulting	1
Cal Dive International	1
Enterprise Products Operating L.P.	1
Exxon Mobil Chemical	2
JE Merit	1

CURRENT EMPLOYER	
	Frequency
PROSafe/Sub-To-Suncor Energy	1
Safe-T-Services	1
Suncor Energy, Inc	2
TD Williamson, Inc	1

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

Six respondents reported that their current employer is categorized as “Manufacturing of Petrochemicals.” Two respondents reported that their current employer did not fit into any of the offered categories. These candidates reported that their employers would classify as “pipeline,” and “safety/reliability consultant.”

CURRENT EMPLOYER		
	Frequency	Percent
Construction application	2	18.2
Government agency	0	0.0
Healthcare application	0	0.0
Manufacturing of	6	54.5

CURRENT EMPLOYER		
	Frequency	Percent
Selling of	1	9.1
Transporting of	0	0.0
Retired	0	0.0
Other	2	18.2

Figure 6. What is your current role/title with your/at current employer?

Respondents were asked to write in their current role/title at their current employer. Results are provided below.

CURRENT EMPLOYER	
	Frequency
Contractor safety administrator	1
Corporate manager HSE	1
EHS manager	1
Fire protection and safety	1
Industrial heliemiist	1
Mgr of manufacturing, reliability and improvement services	1

CURRENT EMPLOYER	
	Frequency
President	1
Process safety engineer	1
Safety	1
Senior safety coordinator- Contractor safety coordinator	1
Training supervisor	1

Figure 7. How many years have you worked in your current role with your current employer?

The respondents were varied in their levels of experience in their current role with their current employer. Five individuals reported working for their current employer in their current role for less than three years; however, three individuals reporting working for their current employer in their current role for more than 15 years.

EXPERIENCE		
	Frequency	Percent
Less than 3 years	5	45.5
3-5 years	1	9.1
6-10 years	2	18.2
Total	8	72.8*

EXPERIENCE		
	Frequency	Percent
11-15 years	0	0.0
16-20 years	2	18.2
More than 20 years	1	9.1
Total	11	27.3*

**Due to rounding error, percentage totals may not always equal 100.*

Figure 8. How many employees work at your facility?

The majority (81.8%) of respondents reported that more than 100 employees worked at their facilities. No respondents reported 50 or less employees at their facilities.

EMPLOYEES		
	Frequency	Percent
1-10 employees	0	0.0
11-25 employees	0	0.0
26-50 employees	0	0.0
Total	0	0.0

EMPLOYEES		
	Frequency	Percent
51-75 employees	1	9.1
76-100 employees	1	9.1
More than 100 employees	9	81.8
Total	11	100.0

Figure 9. How many employees do you supervise?

More than half (54.5%) of respondents reported that they supervised between one and 10 employees. Only one respondent reported supervising greater than 50 employees.

EMPLOYEES SUPERVISED		
	Frequency	Percent
None	4	36.4
1-10 employees	6	54.5
11-25 employees	0	0.0
Total	10	90.9

EMPLOYEES SUPERVISED		
	Frequency	Percent
26-50 employees	0	0.0
51-75 employees	1	9.1
More than 75 employees	0	0.0
Total	11	9.1

Figure 10. In what industries would your previous employers be categorized?

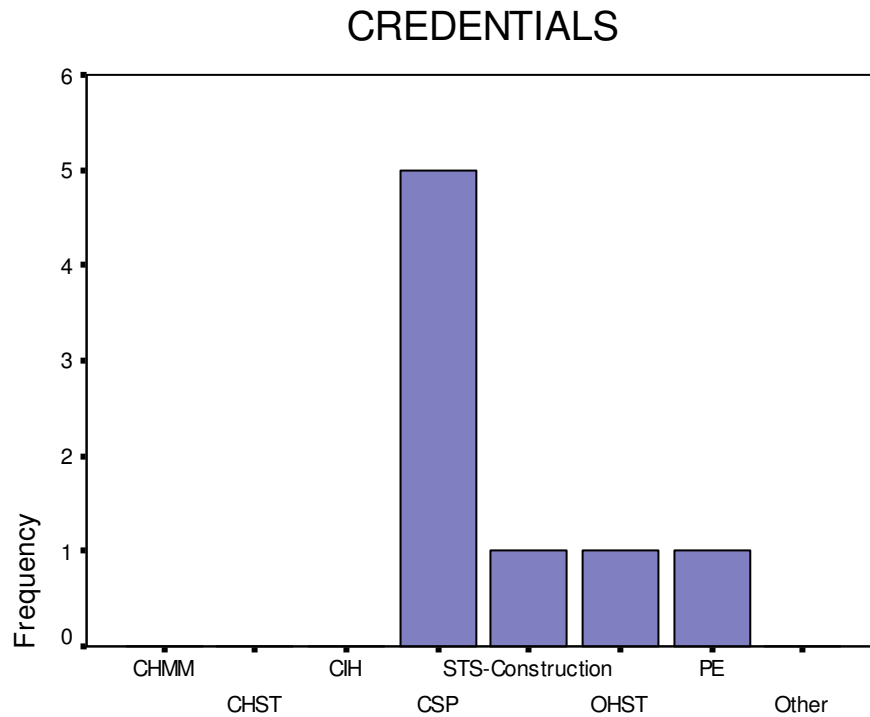
Categorizations for previous employers are provided below. Because respondents were allowed to select more than one response, the total for this question does not equal the number of respondents. The four "Other" employers were reported as: "Computer chips, specialty products," "drilling," "drilling oil & gas," and "federal."

PREVIOUS EMPLOYER	
	Frequency
Construction application	1
Government agency	0
Healthcare application	0
Manufacturing of	4

PREVIOUS EMPLOYER	
	Frequency
Selling of	2
Transporting of	2
Retired	0
Other	4

Figure 11. Which of the following credentials do you hold?

In this question, respondents were allowed to choose all credentials on the list that they held as well as write in any other credentials they had which were not on the list. No individuals reported holding credentials not already listed by the survey.



Evaluation of Tasks

The tasks to be evaluated include:

1. Conduct job safety analyses by performing pre-task hazard analysis and by evaluating PPE, tools, equipment, and job expectations in order to identify potential hazards and reduce the risk of incident or injury.
2. Verify that equipment and facility are inspected in accordance with requirements in order to reduce the risk of loss.
3. Enforce safety, health, and environmental rules and regulations within the work group by coaching and correcting observed deficiencies or by taking appropriate disciplinary action in order to reduce the risk of incident or injury.
4. Take appropriate action when confronted with problems by exercising stop-work authority, modifying tasks, elevating issues, consulting with qualified professionals (when the matter is outside the scope of the supervisor’s capabilities), etc., in order to maintain a safe and healthful work environment.
5. Facilitate a positive, pro-active safety culture by anticipating hazards, modeling and coaching safe behavior, promoting incident reporting, supporting employee participation, and communicating performance measures in order to enhance safety and health.
6. Verify that work group employees are capable of performing work safely by reviewing their training records and job-specific qualifications in order to ensure competent staff.
7. Ensure that new personnel in the work area are oriented to safety, health, and environmental considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.
8. Perform safety, health, and environmental-related record keeping as required by company policy and regulations using established procedures to document essential processes.
9. Participate in employee evaluation by including safety, health, and environmental performance as a key criterion in order to hold employees accountable for safety.
10. Participate in investigations that determine causes, identify corrective actions, and document lessons learned using recognized investigation techniques in order to reduce the risk of workplace incidents and address employee concerns.

11. Implement emergency action plans in accordance with the nature of incidents in order to minimize potential losses.
12. Interact with other work group supervisors using timely communication to coordinate operations and work processes and to minimize risk.

A. Survey Respondents’ Evaluations

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

Importance Ratings

- 1 = **Not Important.** Performance of this task is not essential to the job of the minimally competent STS-General Industry.
- 2 = **Somewhat Important.** Performance of this task is minimally essential to the job of the minimally competent STS- General Industry.
- 3 = **Important.** Performance of this task is moderately essential to the job of the minimally competent STS-General Industry.
- 4 = **Very Important.** Performance of this task is clearly essential to the job of the minimally competent STS-General Industry.
- 5 = **Extremely Important.** Performance of this task is absolutely essential to the job of the minimally STS-General Industry.

As depicted in the following charts, survey respondents indicated that Task 11 and Task 1 were the most important of the 12 tasks. Task 6 was considered the lease important task.

	IMPORTANCE			
	Sample Size (N)	Mean	Standard Error of Mean	Standard Deviation
Task 1	11	4.55	0.1575	0.522
Task 2	11	3.64	0.2033	0.674
Task 3	11	4.36	0.1521	0.505
Task 4	11	4.36	0.2033	0.674
Task 5	11	4.27	0.2727	0.905
Task 6	11	3.36	0.1521	0.505
Task 7	11	4.18	0.2635	0.874
Task 8	11	3.45	0.2817	0.934
Task 9	10	3.70	0.2134	0.675
Task 10	11	4.18	0.2264	0.751
Task 11	11	4.55	0.1575	0.522
Task 12	11	4.00	0.1348	0.447

Criticality Ratings

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

The respondents considered Task 7 and Task 11 to be the most critical of the 12 tasks, followed by Task 1 and Task 3.

	CRITICALITY			
	Sample Size (N)	Mean	Standard Error of Mean	Standard Deviation
Task 1	11	4.36	0.1521	0.505
Task 2	11	3.91	0.2846	0.944
Task 3	11	4.27	0.2371	0.786
Task 4	11	4.18	0.3252	1.079
Task 5	11	3.82	0.4004	1.328
Task 6	11	3.27	0.2727	0.905
Task 7	11	4.45	0.2073	0.688
Task 8	11	2.55	0.3123	1.036
Task 9	10	3.00	0.2582	0.816
Task 10	11	4.09	0.3149	1.044
Task 11	11	4.45	0.2073	0.688
Task 12	11	3.82	0.2264	0.751

Frequency

Frequency: Frequency is defined as the percent of time that the minimally competent STS-Petrochemical spends performing the duties or using the principles associated with each task statement. Rate each of the 12 task statements by indicating in the percent of time that a minimally competent STS-Petrochemical would spend performing duties within the task statement. **PLEASE MAKE THE PERCENTAGES YOU ASSIGN EACH TASK STATEMENT TOTAL 100 PERCENT FOR ALL 12 TASK STATEMENTS.** In the following table, write the percent of time that best exemplifies your frequency rating for each task statement.

Because two respondents did not provide data that totaled 100, there are only nine respondents used in these calculations. The respondents felt Task 1 and Task 5 were performed the most often. Task 3 followed closely behind and was rated as the second-most frequently performed task.

	FREQUENCY			
	Sample Size (N)	Mean	Standard Error of Mean	Standard Deviation
Task 1	9	13.33	1.8634	5.590
Task 2	9	5.56	0.8992	2.698
Task 3	9	12.22	0.8784	2.635
Task 4	9	7.78	1.2108	3.632
Task 5	9	13.33	2.0412	6.124
Task 6	9	5.78	0.8296	2.489
Task 7	9	8.56	1.6254	4.876
Task 8	9	5.78	1.1993	3.598
Task 9	9	5.44	0.9734	2.920
Task 10	9	7.11	1.2410	3.723
Task 11	9	6.78	1.3517	4.055
Task 12	9	8.33	1.3844	4.153

Reliability Analysis of Task Scales

The reliability of the scales was assessed in order to determine how well the tasks consistently 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 task. It is important to understand the consistency of the data along these dimensions in order to draw defensible conclusions. Reliability was measured by internal consistency (Cronbach’s Alpha) using the respondent’s ratings of importance, criticality, and frequency for each task. Reliability coefficients range from 0 to 1 and should be above 0.7 to be judged as adequate. Reliability values below 0.7 indicate an unacceptable amount of measurement error.

For the STS-Petrochemical survey, reliability was unable to be computed for the frequency scale due to lack of variance. For criticality and importance scales, this critical value of 0.7 is easily exceeded.

RELIABILITY		
Importance	Criticality	Frequency
0.7449	0.8621	***

Summary of Results

As shown in the charts on the preceding pages, the survey respondents indicated that all tasks are important. Each of the 12 tasks has an average importance of at least 3.3 on the five-point rating scale, with 3 noting “Important,” 4 noting “Very Important,” and 5 noting “Extremely Important.”

Similarly, the respondents considered all the tasks to be critical. Each of the 12 tasks has an average criticality rating above the midpoint (2.5) on the five-point scale, which means that incompetent performance of tasks could result in at least “Minimal Harm” to “Moderate Harm” to the client, the STS-Petrochemical, the public, etc.

The survey respondents indicated they spend varied amounts of time performing duties in most of the tasks. Amount of time spent in a task ranged for 5.54% of the time to 13.33%.

Several of the tasks were ranked similarly in regards to importance, criticality, and frequency. For example, Task 8 was reported to be the most critical, important, and frequently performed task, and Task 6 was ranked third across all dimensions. However, other tasks were not ranked similarly. For example, while respondents considered Task 5 to be the least critical and the next to least important, it ranked much higher in terms of frequency. This finding suggests that the frequency with which an STS-Petrochemical performs a task does not necessarily correlate with that task's importance or criticality. In other words, a task that is not performed very frequently may still be considered very important and/or critical and vice versa. These outcomes affect the weight that is assigned to that task in the examination blueprint.

Conclusion

The results of the survey validate the results of the role delineation panel. This conclusion means that the tasks and knowledge developed by the role delineation panel constitute an accurate definition of the work of an STS-Petrochemical. Based on a psychometric analysis of the tasks and knowledge identified by the role delineation study, competence in safety trained supervision 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 task that will appear on the certification examination. Test specifications are developed by combining the overall evaluations of importance, criticality, and frequency and converting the results into percentages. These percentages are used to determine the number of questions related to each task that should appear on the multiple-choice format examination.

	TEST BLUEPRINT	
	% of Test	# of Items on Test
Task 1	11.42%	12
Task 2	6.73%	7
Task 3	10.71%	11
Task 4	8.38%	8
Task 5	11.00%	11
Task 6	6.37%	6
Task 7	8.82%	9
Task 8	6.05%	6
Task 9	6.23%	6
Task 10	7.90%	8
Task 11	8.10%	8
Task 12	8.29%	8
TOTAL	100.0%	100

TASKS AND KNOWLEDGE STATEMENTS

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

Task 1: Conduct job safety analyses by performing pre-task hazard analysis and by evaluating PPE, tools, equipment, and job expectations in order to identify potential hazards and reduce the risk of incident or injury.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
1	4.55	4.36	13.33	11.42	12

Knowledge of:

- a. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed
- b. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- c. Limitations of personal protective equipment
- d. Requirements for the selection of personal protective equipment
- e. Principles and applications of hazard control (e.g., energy isolation, permitting)
- f. Safety, health, and environmental resources (e.g., MSDS, key personnel, experts)
- g. Documentation of job safety analysis and procedures derived from the analysis
- h. Basic mathematics

Skill in:

- a. Recognizing hazards and mitigating exposure
- b. Facilitating job safety analysis (identifying job steps)
- c. Communicating the purpose and effectiveness of job safety analysis
- d. Selecting, using, and maintaining personal protective equipment
- e. Using safety, health, and environmental resources
- f. Using basic mathematical formulas

Task 2: Verify that equipment and facility are inspected in accordance with requirements in order to reduce the risk of loss.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
2	3.64	3.91	5.56	6.73	7

Knowledge of:

- a. Company policy and procedure
- b. Manufacturer's requirements
- c. Safety, health, and environmental requirements relevant to work performed (e.g., regulations, consensus standards, best practices)
- d. Safety, health, and environmental management systems
- e. Process safety management requirements

Skill in:

- a. Surveying the worksite
- b. Reviewing documentation (e.g., logbooks, tags)

Task 3: Enforce safety, health, and environmental rules and regulations within the work group by coaching and correcting observed deficiencies or by taking appropriate disciplinary action in order to reduce the risk of incident or injury.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
3	4.36	4.27	12.22	10.71	11

Knowledge of:

- a. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- b. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed
- c. Coaching techniques
- d. Conflict resolution techniques
- e. Appropriate disciplinary policies and procedures
- f. Applicable Process Safety Management
- g. Specific topics: confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, scaffolding, powered industrial trucks, personnel hoisting, fire prevention/protection, HAZWOPER, PPE, handling compressed gasses, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety

Skill in:

- a. Recognizing hazards and mitigating exposure
- b. Coaching safe behavior
- c. Keeping records
- d. Taking appropriate action when observing possible alcohol and other drug abuse at the work place

Task 4: Take appropriate action when confronted with problems by exercising stop-work authority, modifying tasks, elevating issues, consulting with qualified professionals (when the matter is outside the scope of the supervisor’s capabilities), etc., in order to maintain a safe and healthful work environment.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
4	4.36	4.18	7.78	8.38%	8

Knowledge of:

- a. Organizational structure for the company (e.g., hierarchy, chain of command)
- b. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- c. Company policies and procedures
- d. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed
- e. Principles and applications of hazard control (e.g., energy isolation, permitting)
- f. Basic principles of risk assessment

Skill in:

- a. Exercising safety, health, and environmental leadership
- b. Making decisions
- c. Communicating effectively
- d. Analyzing
- e. Resolving conflicts
- f. Recognizing and evaluating high risk problems

Task 5: Facilitate a positive, pro-active safety culture by anticipating hazards, modeling and coaching safe behavior, promoting incident reporting, supporting employee participation, and communicating performance measures in order to enhance safety and health.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
5	4.27	3.82	13.330	11.00%	11

Knowledge of:

- a. Characteristics of proactive safety cultures and reactive safety cultures
- b. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed
- c. Principles and applications of hazard control (e.g., energy isolation, permitting)
- d. Industry-accepted performance measures (e.g., incidence rates)
- e. Conflict resolution techniques
- f. Facilitation and safety communication strategies
- g. Purpose and organization of safety meetings
- h. Company Management of Change procedures

Skill in:

- a. Coaching safe behaviors
- b. Using open, clear, and interactive communication
- c. Using observation to identify unsafe behaviors
- d. Using facilitation skills
- e. Resolving conflicts
- f. Distinguishing types of safety cultures
- g. Leading safety meetings
- h. Communicating Management of Change procedures

Task 6: Verify that work group employees are capable of performing work safely by reviewing their training records and job-specific qualifications in order to ensure competent staff.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
6	3.36	3.27	5.7	6.37%	6

Knowledge of:

- a. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed
- b. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- c. Training and qualifications necessary for specific jobs and/or tasks
- d. Company record keeping system
- e. Evidence of required training (e.g., DOT operator qualifications, HAZWOPER, confined space, PSM operator qualifications, welding, crane operation)
- f. Which individuals are authorized to sign and/or issue permits

Skill in:

- a. Assessing training needs based on requirements and hazards
- b. Keeping records
- c. Making decisions

Task 7: Ensure that new personnel in the work area are oriented to safety, health, and environmental considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
7	4.18	4.45	8.56	8.83%	9

Knowledge of:

- Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed
- Emergency action plan and procedures
- Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- Specific topics: confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, scaffolding, powered industrial trucks, personnel hoisting, fire prevention/protection, HAZWOPER, PPE, handling compressed gasses, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety

Skill in:

- Using open, clear, and interactive communication
- Using observation to identify unsafe behaviors

Task 8: Perform safety, health, and environmental-related record keeping as required by company policy and regulations using established procedures to document essential processes.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
8	3.70	3.00	5.78	6.05%	6

Knowledge of:

- Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- Security and confidentiality requirements of record keeping processes
- Ethical considerations concerning the accuracy of information, conflict of interest, etc.
- Injury management/workers compensation (working knowledge)
- Specific process safety management record keeping requirements: process hazard analysis, process safety information, Management of Change, pre-start-up safety reviews, training, operations procedure verification, process hazard analysis revalidation, site access control

Skill in:

- Keeping records
- Resolving ethical conflicts related to record keeping

Task 9: Participate in employee evaluation by including safety, health, and environmental performance as a key criterion in order to hold employees accountable for safety.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
9	3.70	3.00	5.44	6.23%	6

Knowledge of:

- a. Strategies for evaluating safety behavior, participation in the safety culture, etc.
- b. Observation techniques
- c. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- d. Company-specified safety performance measures for employees
- e. Techniques for safety, health, and environmental performance recognition and reward or correction
- f. Specific topics: confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, scaffolding, powered industrial trucks, personnel hoisting, fire prevention/protection, HAZWOPER, PPE, handling compressed gasses, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety

Skill in:

- a. Communicating to employees effectively
- b. Using observation to identify unsafe behaviors
- c. Listening to concerns and suggestions
- d. Implementing company performance measurement procedures
- e. Comparing safety, health, and environmental performance to applicable standards
- f. Coaching safe behavior
- g. Evaluating employee performance regarding confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, scaffolding, powered industrial trucks, personnel hoisting, fire prevention/protection, HAZWOPER, PPE, handling compressed gasses, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety

Task 10: Participate in investigations that determine causes, identify corrective actions, and document lessons learned using recognized investigation techniques in order to reduce the risk of workplace incidents and address employee concerns.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
10	4.18	4.09	7.11	7.90%	8

Knowledge of:

- a. Purpose and principles of incident investigation
- b. Investigation techniques (e.g., interviewing, evidence collection)
- c. Principles and applications of hazard control
- d. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- e. Lessons learned from incidents at the worksite
- f. Company record keeping requirements
- g. Company policy regarding communication with external entities
- h. Ethical considerations concerning sources of data, accuracy of data, preservation of evidence, application of investigation techniques, reporting, etc.
- i. Process safety management incident investigation requirements (e.g., timeliness, investigation team make up)

Skill in:

- a. Selecting correct investigation techniques
- b. Accessing lessons learned at the worksite and in the industry
- c. Applying investigation techniques correctly
- d. Analyzing and protecting evidence
- e. Communicating results
- f. Resolving ethical conflicts
- g. Applying requirements for confined space entry, hot work permitting, energy isolation, excavation, crane operations, hoists and rigging, fall protection, scaffolding, powered industrial trucks, personnel hoisting, fire prevention/protection, HAZWOPER, PPE, handling compressed gasses, atmospheric monitoring/gas testing, regulated hazardous materials, hazardous waste handling, hearing conservation, ionizing radiation safety

Task 11: Implement emergency action plans in accordance with the nature of incidents in order to minimize potential losses.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
11	4.55	4.45	6.78	8.10%	8

Knowledge of:

- a. Emergency action plans
- b. Emergency procedures
- c. Terminology used in emergency action plans.
- d. Techniques for implementing exercises
- e. Safety, health, and environmental requirements relevant to the work performed (e.g., regulations, consensus standards, best practices)
- f. Record keeping requirements

Skill in:

- a. Recognizing the nature and severity of incidents
- b. Determining actions needed
- c. Executing the emergency action plan
- d. Communicating effectively
- e. Keeping records
- f. Facilitating post exercise/incident evaluation

Task 12: Interact with other work group supervisors using timely communication to coordinate operations and work processes and to minimize risk.

Evaluation and Allocation of Questions for Multiple-Choice Examination

	RATINGS				
	Importance	Criticality	Frequency	% of Items on Test	# of Items on Test
12	4.00	3.82	8.33	8.29%	8

Knowledge of:

- a. Hazards (e.g., biological, chemical, physical, ergonomic) related to work process, equipment, and tools needed
- b. Principles and applications of hazard control
- c. Leadership techniques
- d. Facilitation techniques
- e. Effective communication techniques (e.g., among shifts, simultaneous work groups, different levels of the hierarchy within the company)
- f. Company policy and procedure
- g. Company record keeping requirements
- h. Specific PSM contractor requirements

Skill in:

- a. Using open, clear, and interactive communication
- b. Using techniques for minimizing risk
- c. Making decisions
- d. Recognizing hazards and mitigating exposure

**APPENDIX A:
ROLE DELINEATION SURVEY PARTICIPANTS**

Larry E. Brown, OHST
Baton Rouge, LA

Don Enslow
Anchorage, AK

Quirino Escamilla, OHST
Friendswood, TX

Carole Frye, CSP, OHST
Pearland, TX

Allen O Graff, OHST
Katy, TX

Bobby Wilson, OHST
Sugarland, TX

**APPENDIX B:
ROLE DELINEATION SURVEY**

**Instructions for Completing the
Council on Certification of Health, Environmental
and Safety Technologists (CCHEST)
Role Delineation Survey for the
Safety Trained Supervisor – Petrochemical (STS-Petrochemical)**

This booklet contains the Council on Certification of Health, Environmental and Safety Technologists (CCHEST) Safety Trained Supervisor in Petrochemical (STS-Petrochemical) 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 individuals 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 ***Task Statements*** that define the duties of an STS-Petrochemical. We ask that you rate the importance, criticality, and frequency of these task statements as they pertain to the minimally competent STS-Petrochemical.

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 CCHEST STS-Petrochemical examination. Please return your completed survey by **4 November 2003** 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 individuals 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 do you live?

4. What is the name of your current employer?

5. In what industry would your current employer be categorized? *(Check only one.)*

Petrochemical – construction application

Petrochemical – selling of

Petrochemical – government agency

Petrochemical – transportation of

Petrochemical – healthcare application

Retired

Petrochemical – manufacturing of

Other *(Please specify.)*

6. What is your current role/title with/at your current employer?

7. How many years have you worked in your current role with your current employer? *(Check only one.)*
- | | | |
|--|--------------------------------------|---|
| <input type="checkbox"/> Less than 3 years | <input type="checkbox"/> 6-10 years | <input type="checkbox"/> 16-20 years |
| <input type="checkbox"/> 3-5 years | <input type="checkbox"/> 11-15 years | <input type="checkbox"/> More than 20 years |
8. How many employees work at your facility? *(Check only one.)*
- | | | |
|--|--|--|
| <input type="checkbox"/> 1-10 employees | <input type="checkbox"/> 26-50 employees | <input type="checkbox"/> 76-100 employees |
| <input type="checkbox"/> 11-25 employees | <input type="checkbox"/> 51-75 employees | <input type="checkbox"/> More than 100 employees |
9. How many employees do you supervise? *(Check only one.)*
- | | | |
|---|--|---|
| <input type="checkbox"/> None | <input type="checkbox"/> 11-25 employees | <input type="checkbox"/> 51-75 employees |
| <input type="checkbox"/> 1-10 employees | <input type="checkbox"/> 26-50 employees | <input type="checkbox"/> More than 75 employees |
10. What are the names of your previous employers?
-
-
11. In what industries would your previous employers be categorized? *(Select all that apply.)*
- | | |
|---|--|
| <input type="checkbox"/> Petrochemical – construction application | <input type="checkbox"/> Petrochemical – selling of |
| <input type="checkbox"/> Petrochemical – government agency | <input type="checkbox"/> Petrochemical – transportation of |
| <input type="checkbox"/> Petrochemical – healthcare application | <input type="checkbox"/> Retired |
| <input type="checkbox"/> Petrochemical – manufacturing of | <input type="checkbox"/> Other <i>(Please specify.)</i> |
-
12. Which of the following credentials do you hold? *(Select all that apply.)*
- | | | |
|-------------------------------|---|---|
| <input type="checkbox"/> CHMM | <input type="checkbox"/> CSP | <input type="checkbox"/> PE |
| <input type="checkbox"/> CHST | <input type="checkbox"/> STS-Construction | <input type="checkbox"/> Other <i>(Please specify.)</i> |
| <input type="checkbox"/> CIH | <input type="checkbox"/> OHST | |
-

Section B Definition of Terms

Below you will find definitions of the some of the terms found in this Role Delineation Survey. Please review this information before completing the survey.

Safety Trained Supervisor in Petrochemical (STS-Petrochemical): The Safety Trained Supervisor in Petrochemical (STS-Petrochemical) is a crew chief, foreman, or other type of supervisor who, among other duties, is responsible for the identification, prevention, and control of hazards that may develop in or result from work processes and/or work environment. The STS has 30 contact hours of training in safety and three years of experience in the petrochemical field (not necessarily as a supervisor).

Task Statement: The task statements are the major responsibilities or duties that define the role of the STS-Petrochemical. Each task statement may be considered a major heading in an outline. 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 Task Statements

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

Importance: Importance is defined as the degree to which the knowledge covered in the task statement is essential to the job performance of a minimally competent STS-Petrochemical. Indicate how important each task statement is to the performance of a minimally competent STS-Petrochemical. Rate each of the 12 task statements by using the scale below. Please assign each task statement **only one** rating. **DO NOT RANK THE TASK STATEMENTS.** In the following table, circle the number of the description below that best exemplifies your importance rating for each task statement.

- 1 = **Not Important.** Performance of the task is not essential to the job performance of the minimally competent STS-Petrochemical.
- 2 = **Somewhat Important.** Performance of the task is minimally essential to the job of the minimally competent STS-Petrochemical.
- 3 = **Important.** Performance of the task is moderately essential to the job of the minimally competent STS-Petrochemical.
- 4 = **Very Important.** Performance of the task is clearly essential to the job of the minimally competent STS-Petrochemical.
- 5 = **Extremely Important.** Performance of the task is absolutely essential to the job of the minimally competent STS-Petrochemical.

Criticality: Criticality is defined as the degree to which adverse effects could result if the minimally competent STS-Petrochemical is not knowledgeable in the task statement. Indicate the degree to which the inability to perform the task 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 12 task statements by using the scale below. Please assign each task statement **only one** rating. **DO NOT RANK THE TASK STATEMENTS.** In the following table, circle the number of the description below that best exemplifies your criticality rating for each task statement.

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

Frequency: Frequency is defined as the percent of time that the minimally competent STS-Petrochemical spends performing the duties or using the principles associated with each task statement. Rate each of the 12 task statements by indicating in the percent of time that a minimally competent STS-Petrochemical would spend performing duties within the task statement. **PLEASE MAKE THE PERCENTAGES YOU ASSIGN EACH TASK STATEMENT TOTAL 100 PERCENT FOR ALL 12 TASK STATEMENTS.** In the following table, write the percent of time that best exemplifies your frequency rating for each task statement.

Using the *Importance, Criticality, and Frequency* scales described on the previous pages and noted below, please rate the task statements.

Rating Scales

Importance	Criticality*
1 - Not important	1 - Causing no harm
2 - Somewhat important	2 - Causing minimal harm
3 - Important	3 - Causing moderate harm
4 - Very important	4 - Causing significant harm
5 - Extremely important	5 - Causing extreme harm

**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.

Task Statement	Importance	Criticality	Frequency
<i>Task 1: Conduct job safety analyses by performing pre-task hazard analysis and by evaluating PPE, tools, equipment, and job expectations in order to identify potential hazards and reduce the risk of incident or injury.</i>	1 2 3 4 5	1 2 3 4 5	_____%
<i>Task 2: Verify that equipment and facility are inspected in accordance with requirements in order to reduce the risk of loss.</i>	1 2 3 4 5	1 2 3 4 5	_____%
<i>Task 3: Enforce safety, health, and environmental rules and regulations within the work group by coaching and correcting observed deficiencies or by taking appropriate disciplinary action in order to reduce the risk of incident or injury.</i>	1 2 3 4 5	1 2 3 4 5	_____%
<i>Task 4: Take appropriate action when confronted with problems by exercising stop-work authority, modifying tasks, elevating issues, consulting with qualified professionals (when the matter is outside the scope of the supervisor's capabilities), etc., in order to maintain a safe and healthful work environment.</i>	1 2 3 4 5	1 2 3 4 5	_____%
<i>Task 5: Facilitate a positive, pro-active safety culture by anticipating hazards, modeling and coaching safe behavior, promoting incident reporting, supporting employee participation, and communicating performance measures in order to enhance safety and health.</i>	1 2 3 4 5	1 2 3 4 5	_____%
<i>Task 6: Verify that work group employees are capable of performing work safely by reviewing their training records and job-specific qualifications in order to ensure competent staff.</i>	1 2 3 4 5	1 2 3 4 5	_____%

Rating Scales

Importance	Criticality*
1 - Not important	1 - Causing no harm
2 - Somewhat important	2 - Causing minimal harm
3 - Important	3 - Causing moderate harm
4 - Very important	4 - Causing significant harm
5 - Extremely important	5 - Causing extreme harm

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

Task Statement	Importance	Criticality	Frequency
<i>Task 7: Ensure that new personnel in the work area are oriented to safety, health, and environmental considerations by communicating potential and existing hazards and monitoring behavior in order to make sure that applicable rules and emergency action plans are understood.</i>	1 2 3 4 5	1 2 3 4 5	_____ %
<i>Task 8: Perform safety, health, and environmental-related record keeping as required by company policy and regulations using established procedures to document essential processes.</i>	1 2 3 4 5	1 2 3 4 5	_____ %
<i>Task 9: Participate in employee evaluation by including safety, health, and environmental performance as a key criterion in order to hold employees accountable for safety.</i>	1 2 3 4 5	1 2 3 4 5	_____ %
<i>Task 10: Participate in investigations that determine causes, identify corrective actions, and document lessons learned using recognized investigation techniques in order to reduce the risk of workplace incidents and address employee concerns.</i>	1 2 3 4 5	1 2 3 4 5	_____ %
<i>Task 11: Implement emergency action plans in accordance with the nature of incidents in order to minimize potential losses.</i>	1 2 3 4 5	1 2 3 4 5	_____ %
<i>Task 12: Interact with other work group supervisors using timely communication to coordinate operations and work processes and to minimize risk.</i>	1 2 3 4 5	1 2 3 4 5	_____ %
			100% TOTAL

Please list any tasks that you think may have been overlooked.
