



**40 Hour Program
Technician-level Emergency Responder
Participant Exercise Manual**

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Midwest Consortium for Hazardous Waste Worker Training

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Introduction to HAZWOPER Emergency Response

Exercise — Make a List

Think about your work place or the workplaces that you serve. What are the hazardous materials that could be released? What is your main concern regarding each material (examples: health effects, fire, explosion)?

List the materials of interest to you, and why.

Material	Why

If done in small groups, prepare a report back to the larger group.

Chemical Properties

Exercise – Using the NIOSH Pocket Guide (NPG) to Find Chemical Properties

Your instructor will provide you with a list of several chemicals. Use the table on the following page to list important information on each chemical from the NPG.

Working in small groups, use one table for each chemical (more work sheets will be distributed if necessary).

During the report back, discuss which chemical is of greatest concern, if there was a release? Why?

Chemical Properties Worksheet

Chemical name:

Synonyms and Trade Names

CAS Number

Physical Description

BP

VP

Fl.P.

UEL

LEL

RGasD

Incompatibilities & Reactivities

Look at the line above "Incompatibilities & Reactivities" in the NPG. What information is there?

Toxicology and Health Effects

Exercise – Using the NIOSH Pocket Guide to Find Health Effect Information

Worksheet

Chemical name: _____

What are the routes of exposure?

List the symptoms of exposure

List the target organs that may be affected

Is this chemical a carcinogen?

Personal Protective Equipment (PPE)

Exercise – Using the NIOSH Pocket Guide to find Occupational Exposure Levels and Protective Measures

Your instructor will provide you with the measured concentration for the chemical that you found information on properties and health effects.

Complete the work sheet on the next page, considering the measured concentration.

Does this information on exposure guidelines/standards and the airborne concentration alter your evaluation of 'greatest concern'? Why?

Occupational Exposure Levels and Protective Measures Worksheet

Chemical Name: _____

Measured concentration: _____

NIOSH recommended exposure level (REL)

OSHA permissible exposure level (PEL)

IDLH level

What would you do if it got on your skin?

What occupational exposure limit was not listed?

What respirator is required at the measured concentration?

Exercise - Respirator Protection Factor

Working in groups, perform the following calculations:

1. You are a responder to a spill of chlorobenzene. The safety officer has sampled using a detector tube and reports need for a full facepiece SCBA in demand mode?

APF for respirator _____

PEL for chemical _____

IDLH for chemical _____

MUC for the combination of respirator and chemical _____

2. You are working when an ammonia leak occurs; the concentration is measured at 3,500 ppm. What is the minimum type of respiratory protection that can be *safely* used?

Airborne concentration _____

PEL for chemical _____

IDLH for chemical _____

Type of respirator _____

Exercise – Respiratory Protection Scenarios

You have been assigned and fit tested for a full-face APR as a member of the response team. In the following two situations, determine whether you will have adequate protection working at the point of emission/release.

Working in groups, explain your answers in the space provided.

The industrial hygienist has made a reading of 750 ppm of methyl chloride near the source of a spill from a container. Are you adequately protected if you wear your full-face APR to patch the container? Explain your answer.

PEL _____

IDLH _____

APF _____

.

The safety officer has reported readings of 200 and 215 ppm of N,N-Dimethylaniline near a pool under a leaking pipe. You are asked to repair the pipe to stop the leak. Is your full-face APR sufficient for this task? Explain your answer.

PEL _____

IDLH _____

APF _____

Exercise – Respiratory Protection Demo and Workshop

The purpose of this workshop is to give you the opportunity to wear and become familiar with SCBAs, air-purifying respirators (APRs), egress units, and respiratory protection inspection and cleaning procedures. This workshop includes four activities:

1. Donning and doffing SCBA
2. Qualitative fit testing an APR
3. Inspecting and cleaning respirators
4. Wearing an airline with escape unit

Copies of Performance Checklists for this exercise are provided on the following pages. However, the facilitator may hand out duplicates of these checklists that you will complete, have signed by the facilitator, and turn in at the end of the workshop. The training center retains this information with your other training records. Therefore, you may want to record your lab results separately for your personal records.

Name: _____

Respiratory Protection Performance Checklist

Station 1: Donning and Doffing an SCBA

1. What brand of SCBA and size of facepiece did you wear?

Brand _____ Size _____

2. Please list the brands and sizes of facepieces you tried that could not pass the negative pressure fit test.

Brand _____ Size _____

Brand _____ Size _____

Brand _____ Size _____

3. Before donning the SCBA, did you check your:

a. Cylinders?----- Yes No

b. Alarm? ----- Yes No

c. Regulator gauge? ----- Yes No

d. Straps? ----- Yes No

4. Did you don the SCBA as you were instructed?----- Yes No

5. While wearing the SCBA, did you:

a. Check the bypass valve?----- Yes No

b. Wear the SCBA for at least 7 minutes?----- Yes No

c. Try to communicate with your buddy?----- Yes No

Name: _____

**Respiratory Protection Performance Checklist Station 1 (cont.):
Donning and Doffing an SCBA**

6. While wearing the SCBA, did you do an assigned task? ----- Yes No

If yes, describe the task: _____

7. After doffing the SCBA, did you:

a. Extend the harness straps? ----- Yes No

b. Extend the facepiece straps? ----- Yes No

c. Clean the facepiece? ----- Yes No

d. Check the cylinder? ----- Yes No

i. Did the cylinder need to be changed? ----- Yes No

ii. If yes, did you have it changed? ----- Yes No

8. How long did you wear the SCBA? _____ minutes

Date _____ Instructor's Signature _____

Name: _____

Respiratory Protection Performance Checklist
Station 2: Qualitative Fit Testing an APR

1. Please check any of the following items that you wear.

- Prescription glasses
- Dentures
- A beard
- Contact lenses
- Hairstyle that prohibits a good face seal

2. Did you do a negative-pressure fit check? Yes No

3. Did you do a positive-pressure fit check? Yes No

4. Did you go into a test chamber? Yes No

If yes, which type of chamber?

- "Banana oil"
- Smoke
- Both
- Other

5. What brand and size of air-purifying respirator did you wear?

Brand _____ Size _____

Full-face _____ Half-face _____

Name: _____

Respiratory Protection Performance Checklist

Station 2 (cont.): Fit Testing an APR

6. Please list the brands and sizes of respirators you tried that could not pass the fit test.

Brand _____ Size _____

Brand _____ Size _____

Brand _____ Size _____

Brand _____ Size _____

7. Did you wash your respirator during this lab?----- Yes No

If yes, check the supplies that you used.

Towelette

Wash basin

Other

8. How long did you wear the respirator? _____ minutes

Date _____ Instructor's Signature: _____

Name: _____

Respiratory Protection Performance Checklist

Inspecting and Cleaning Respirators

Daily Maintenance of Your Respirator:

1. Did the instructor tell you how to wash your respirator?----- Yes No
2. Did you clean your respirator? ----- Yes No
3. Did you see a disassembled respirator and all its parts? ----- Yes No
If yes, did someone in the lab reassemble the respirator? ----- Yes No
4. Did someone in your lab inspect a respirator? ----- Yes No
5. Were defects found during the inspection?----- Yes No

If yes, describe the defects: _____

OSHA-Required Inspections of SCBA:

6. Was the inspection procedure that must be done at least once per month described? ----- Yes No
7. Were you shown the hydrostatic test date? ----- Yes No
8. Did you see someone demonstrate inspection of an SCBA according to the manufacturer's guidelines? ----- Yes No

Date _____ Instructor's Signature: _____

Name: _____

Respiratory Protection Performance Checklist

Wearing an Airline with Escape Unit

1. Did the station leader demonstrate how to hook up and use the unit? --- Yes No
2. Did the station leader demonstrate how to switch to the 5-minute escape bottle?
----- Yes No
3. Did one of the trainees in the lab wear an egress unit? ----- Yes No
4. Did you wear the unit? ----- Yes No
5. Did a trainee who wore the egress unit switch to the 5-minute escape bottle?
----- Yes No
6. Please indicate which level of protection is provided by an airline egress unit.
 A B C

Date _____ Instructor's Signature: _____

Exercise - Levels of Protection

In your small group, discuss each of the situations below, and decide what level of protection is required.

1. At XYZ Inc. 15 drums identified to contain dioxane have been toppled, and some are leaking. What level of protection should be used to stop/contain the leak(s) and restage the drums for removal?
2. A tractor trailer has jackknifed, and a cloud is escaping from the open door at the back end of the trailer; the cloud is drifting toward the tractor. What level of protection should be worn to help the driver who appears to be unconscious?
3. You are responding to a small leak (puddle is 1 x 1.5 feet; stream the size of a pencil) from a 55-gallon drum of ethanol on a loading pad. What do you wear as you approach the drum to plug the leak?
4. At a food processing plant, ammonia is detected at a perimeter monitoring station. What level of protection do you wear to check the perimeter station?
5. At a food processing plant, ammonia is entering the warehouse. What level of protection is used to approach the pipe that has been damaged to stop the leak?

Exercise – Level C Checkout and Dressout

The purpose of this workshop is to give you the opportunity to Checkout Level C PPE and don and doff Level C protective gear.

There are two Performance Checklists for this exercise on the following pages. However, the facilitator may hand out duplicates for you to complete, have signed by the facilitator, and turn in at the end of the workshop.

The training center retains this information with your other training records. Therefore, you may want to record your results separately for your personal records.

PPE Checkout

Name _____

Performance Checklist

Buddy's Name: _____

1. Inspection procedures were described for:

- a. Boots? Yes No
- b. Outer gloves? Yes No
- c. Inner gloves? Yes No
- d. Hard hats? Yes No
- e. Reusable suits? Yes No
- f. Other _____ Yes No

2. Did you inspect outer the gloves? Yes No

Did you find defects in the glove? Yes No

If yes, describe the defects: _____

3. Did you inspect inner gloves? Yes No

Did you find defects in the inner glove? Yes No

If yes, describe the defects: _____

4. Did you inspect the suit? Yes No

Did you find defects in the reusable suit? Yes No

If yes, describe the defects: _____

5. We also inspected _____ Yes No

Did you find defects in this PPE? Yes No

If yes, describe the defects: _____

Date _____ Instructor's Signature: _____

**PPE Performance Checklist
Donning and Doffing Level C**

1. List the size that you chose for all of the following equipment. If you did not wear the listed equipment, put an "X" on the line.

- Chemical-protective clothing Size _____
- Air-purifying respirator Size _____ Brand _____
- Boots Size _____
- Inner gloves Size _____
- Outer gloves Size _____
- Hard hat Size = adjustable

List any equipment for which you could not find a proper size, and state whether you needed a larger or smaller size.

Type of Equipment _____ Size _____
 Type of Equipment _____ Size _____

- 2. Did you inspect the equipment before donning it? Yes No
- 3. Did your buddy:
 - a. Make pull tabs when taping your boots/pants? Yes No
 - b. Make pull tabs when taping your gloves/sleeves? Yes No
 - c. Review the communications system with you? Yes No
- 4. Did you do an assigned task? Yes No
 If yes, describe the task: _____

- 5. Did you take off the suit in a manner that would protect you and the other workers around you from contamination? Yes No
- 6. Did you remove your inner gloves properly? Yes No
- 7. When removing your respirator:
 - a. Were you wearing your inner gloves? Yes No
 - b. Did you extend your facepiece straps? Yes No
 - c. Did you wash the respirator? Yes No
- 8. How long did you stay in Level C? _____ minutes

Date _____ Instructor's Signature: _____

Exercise –Level B Dressout

The purpose of this workshop is to give you the opportunity to don and doff Level B protective gear.

A Performance Checklist for this exercise is provided on the following pages. However, the facilitator may hand out a duplicate checklist for you to complete, have signed by the facilitator, and turn in at the end of the workshop.

The training center retains this information with your other training records. Therefore, you may want to record your results separately for your personal records.

Name: _____

Buddy's Name: _____

PPE Performance Checklist – Donning and Doffing Level B

1. List the size that you chose for all of the following equipment. If you did not wear the listed equipment, put an "X" on the line.

- a. Chemical-protective clothing Size _____
- b. Air-purifying respirator Size _____ Brand _____
- c. Boots Size _____
- d. Inner gloves Size _____
- e. Outer gloves Size _____
- f. Hard hat Size = adjustable

List any equipment for which you could not find a proper size, and state whether you needed a larger or smaller size.

Type of Equipment _____ Size _____
Type of Equipment _____ Size _____
Type of Equipment _____ Size _____

2. Did you inspect the equipment before donning it? Yes No

3. Did your buddy:

- a. Make pull tabs when taping your boots/pants? Yes No
- b. Make pull tabs when taping your gloves/sleeves? Yes No
- c. Review the communications system with you? Yes No

4. Did you do an assigned task? Yes No

If yes, describe the task: _____

5. After doffing the SCBA, did you:

- a. Extend the harness straps? Yes No
- b. Extend the facepiece straps? Yes No
- c. Clean the facepiece? Yes No
- d. Check the cylinder? Yes No

If yes, did the cylinder need to be changed? Yes No

If yes, did you change it or have it changed? Yes No

6. How long did you stay in Level B? _____ minutes

Date _____ Instructor's Signature _____

Exercise – Level A Dressout

The purpose of this workshop is to give you the opportunity to don and doff Level A protective gear.

A Performance Checklist for this exercise is provided on the following pages. However, the facilitator may hand out a duplicate for you to complete, have signed by the facilitator, and turn in at the end of the workshop.

The training center retains this information with your other training records. Therefore, you may want to record your results separately for your personal records.

Name: _____

Buddy's Name: _____

PPE Performance Checklist--Donning and Doffing Level A

Preparing to Don the Equipment

1. List the size that you chose for all of the following equipment. If you did not wear the listed equipment, put an "X" on the line.

- a. Disposable suit Size _____
- b. SCBA facepiece Size _____ Brand _____
- c. Level A training suit Size _____
- d. Boots Size _____
- e. Inner gloves Size _____
- f. Outer gloves Size _____
- g. Hard hat Size = adjustable

List any equipment for which you could not find a proper size, and state whether you needed a larger or smaller size.

Type of Equipment _____ Size _____

Type of Equipment _____ Size _____

Type of Equipment _____ Size _____

2. Did you inspect the equipment before donning it?..... Yes No

3. Did you and your buddy help each other get dressed? Yes No

Donning the Equipment

4. Did you do a negative-pressure check of your facepiece? Yes No

5. Did you check the SCBA by-pass valve before you put on Level A?.. Yes No

6. Did your buddy ask if you could breathe OK before your suit was closed??
..... Yes No

Name: _____

Buddy's Name: _____

PPE Performance Checklist--Donning and Doffing Level A (Continued)

Hooked to Air in Level A

7. Did your buddy check your suit's sealing points (zipper, cuff, ted.) after your suit was closed? Yes No

8. Did you and your buddy review the communications system after your suit was closed? Yes No

9. Did you withdraw your hand from the sleeve of the suit and turn on the SCBA emergency by-pass valve? Yes No

10. Did you have to withdraw your hand and defog your face shield?? Yes No

11. Did you do an assigned task? Yes No

If yes, describe the task: _____

Doffing the Equipment

12. Did you touch the outside of your suit as it was being removed? Yes No

13. Did you remove your inner gloves properly? Yes No

14. Did you dry your suit as instructed? Yes No

15. After doffing the SCBA, did you:

a. Extend the harness straps? Yes No

b. Extend the facepiece straps? Yes No

c. Clean the facepiece? Yes No

d. Check the cylinder? Yes No

If yes, did the cylinder need to be changed? Yes No

If yes, did you change it or have it changed? Yes No

16. How long did you stay in Level A? _____ minutes

Date _____ Instructor's Signature: _____

Exercise – Using the OSHA standards and Other Guidelines

Using a PPE standard or guideline provided by the Facilitator, work in groups to complete the work sheet below on requirements. One member of the group should prepare the report back from the worksheet.

OSHA Standard/Other Guideline title: _____

When is this PPE required?

What steps must be taken to fit the PPE to the worker?

What training is required? How often?

Are there medical restrictions to use?

What are the limitations?

Where is the PPE stored?

Is work needed to meet the requirements of the standard? (be specific)

Material Identification

Exercise - Pictograms

This exercise checks your knowledge of the meaning of Pictograms included on labels. The pictograms are an important summary resource to help identify hazards during a response.

In your group, identify the hazard(s) represented by each pictogram. Look back at your NIOSH Pocket Guide worksheets to identify hazardous materials that should have the pictogram on the label.

Worksheet: Pictogram—Hazard and Hazardous Material

Pictogram	Hazard	Hazardous Material (example)
		
		
		
		
		
		
		
		

Exercise – Placards and Labels

Using the placard or label provided by the facilitator, work in small groups to answer the following questions:

1. What is the name of the chemical?
2. What does the placard or label tell you about the chemical?
3. What are the physical hazards of the substance—explosion, fire, reactive, oxidizing material, etc.?
4. What are the health hazards?
5. What target organs does this chemical affect?
6. What are the safe handling recommendations?
7. What personal protective equipment is recommended to limit worker exposure?
8. Is First Aid information given? What is it?
9. Is the chemical volatile? What is the vapor pressure and vapor density?

Exercise –Finding Safety and Health Information, SDS

Your facilitator will provide resources (SDSs for hazardous material(s) of interest or internet access to use electronic resources.

SDS exercise - Use the SDS provided to your group to find the information requested in the worksheet on the next page.

Worksheet – Information in an SDS

Name of hazardous material _____

Type of information	Section	Answer/Information
What is the appropriate firefighting agent?		
What is the physical form of the hazard?		
Is a respirator needed?		
What is the allowable workplace exposure (PEL or TLV)		
What is the hazard?		
What PPE is needed?		
Show information from two different sections that must be on the label.		
Are there storage requirements?		
Do I need special tools?		
Is there a contact, if needed?		
What is the product?		
Is there an acute health effect?		
What action is need if someone is splashed on the skin?		

Exercise – Finding Safety and Health Information, Electronic Resources

Overview

Electronic resources are increasingly useful tools for emergency responders. In this Incident Command System exercise you will use several online databases as resources to gather information needed to plan a response to an emergency scenario.

Objectives

1. Access electronic resources.
2. Demonstrate the use of online resources such as WISER, CAMEO, NAERG and NPG to gather information and complete a worksheet for an emergency response to a scenario.

Your facilitator will provide guidance on which sections each group should complete.

Gather Information

Using the online resources demonstrated in class, spend about 1 hour completing the hazardous substance information worksheet on the next 4 pages for the following scenario:

“Your emergency response team has been called to the chemical supply room at your manufacturing facility. The area supervisor indicates that a 400-gallon intermodal container or tote containing (acetone or other flammable liquid) has developed a significant leak around its valve assembly. All workers have been evacuated from the area, but a large pool of product, estimated to be approximately 100 gallons, is on the floor.”

Haz-Mat Staff Positions

Haz-Mat Director _____	Incident Commander _____
Safety Officer _____	Finance/Admin. _____
Decon Officer _____	Logistics _____
Monitoring Officer _____	Operations _____
Science Officer _____	Planning _____
EMS Officer _____	Safety _____
Hazmat Radio Channel _____	All other On-Site Radio Channel _____

Hazardous Substance Information Worksheet

Product Identification:

Common Name: _____				Chemical Name: _____			
DOT Class: _____		Shipping Label: _____		ID #: _____		CAS #: _____	
Manufacturer: _____							
NFPA 704:	Health (Blue):	—	Flammability (Red):	—	Reactivity (Yellow):	—	Special Hazards: _____

Weather Conditions:

Temperature: _____	Humidity: _____	Precipitation: _____	Sky: _____
Dew Point: _____	Barometric Pressure: _____	Inversion Height: _____	
Wind Direction: _____	Wind Speed: _____	Forecast: _____	

Physical Properties:

Reference Sources: (Consult three different sources)	#1: Page: _____	#2: Page: _____	#3: Page: _____
Physical Description:			
Color:			
Odor:			
Odor Threshold:			
Specific Gravity:			
Relative Gas Density:			
Vapor Pressure:	mm Hg at F	mm Hg at F	mm Hg at F
↑Boiling/↑Condensing Point:	F	F	F
Melting/ Freezing Point:	F	F	F
Expansion Ratio for gases:			
Solubility In Water: <input type="checkbox"/> Y <input type="checkbox"/> N	%	%	%
Soluble With What:			
Degree Of Solubility:			
Molecular Weight:			
Conversion from mg/m ³ to ppm: 24.45 x TLV (mg/m ³) / MW			
Other:			

Flammability Properties: Yes No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
LEL:			
UEL:			
Flash Point:			
Autoignition Temperature			
Decomposition: <input type="checkbox"/> Y <input type="checkbox"/> N			
Explosion Potential: <input type="checkbox"/> Y <input type="checkbox"/> N			
Toxic Products of Combustion:			
Extinguishing Agents:			
Other: _____			

Reactivity Properties: Yes No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
Pyrophoric: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Explosive: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Polymerization: <input type="checkbox"/> Yes <input type="checkbox"/> No			
With what other Chemicals?			
Other: _____			

Corrosive Properties: Yes No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
Skin: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Metal: <input type="checkbox"/> Yes <input type="checkbox"/> No			
pH:			
Neutralizing Agent:			
Other: _____			

Radioactive Properties: Yes No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
Alpha			
Beta:			
Gamma:			
Neutrons:			

Toxicity Properties: Yes No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
PEL:			
IDLH:			
TWA:			
STEL:			
CEILING:			
LD ₅₀			
LC ₅₀			
Inhalation: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Ingestion: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Skin Absorption: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Eye Absorption: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Carcinogen: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Teratogen: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Mutagenic: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Aquatic: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Other: _____			

Target Organs: Yes No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
	_____	_____	_____

Exposure Signs/Symptoms:

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Recommended PPE:

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

First Aid:

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Mitigation Procedures:

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Shelter, Protection, Evacuation Procedures:

Discuss

Be ready to discuss the following:

- Who would compile the information in the worksheet?
- How would information developed on this form be used in the Incident Command System?
- Using information from the worksheet, prepare an entry briefing for your staff.
- What information on this form would be of value for making strategic decisions regarding:
 - PPE?
 - Decon?
 - Evacuation?
 - Hazard Control?

Monitoring

You will work in small groups and do one of the following monitoring exercises. A work sheet is provided for each exercise. At the end of the exercise, complete the Performance Checklist. The Facilitator will review and sign to document skill.

Exercise – Measuring Concentration #1

Station 1. Calibration

Check the calibration of the instrument you have been given. If not in acceptable limits, calibrate the meter.

For the bag of gas you have been given, complete the following with your instrument; put NA if not measured:

LEL %	% O ₂	H ₂ S ppm	CO ppm	Other (show units)

Station 2. Colorimetric Tubes

Leak check the pump and prepare the tube(s) for use. Using the same bag, determine the chemical(s) present and read the concentration.

Chemical(s)	1	2	3
Concentration			

Station 3. Response Factor

1. Measure the concentration of hexane in the bag using a colorimetric tube.
_____ ppm
2. Measure the concentration of hexane using the PID provided.
_____ ppm
3. Calculate the 'response factor'

$$RF = \frac{\text{colorimetric tube concentration}}{\text{PID concentration}}$$

Station 4. Practical Application

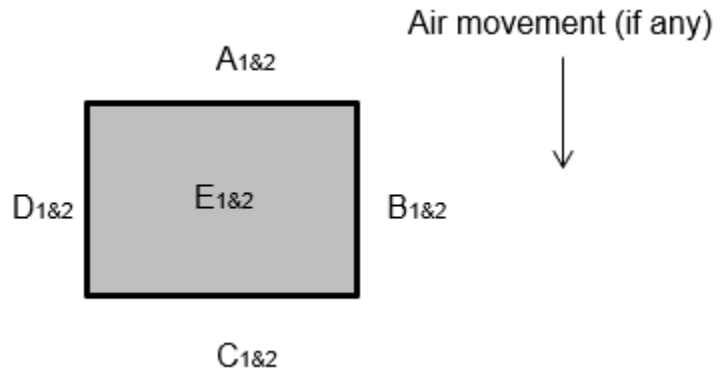
Vertical tube. Evaluate O₂, LEL and concentrations with your multi-gas meter at the three sample ports in the vertical tube set up by the facilitator. Complete the table below:

	LEL	O ₂	Chemical 1	Chemical 2
Top port				
Middle port				
Bottom port				

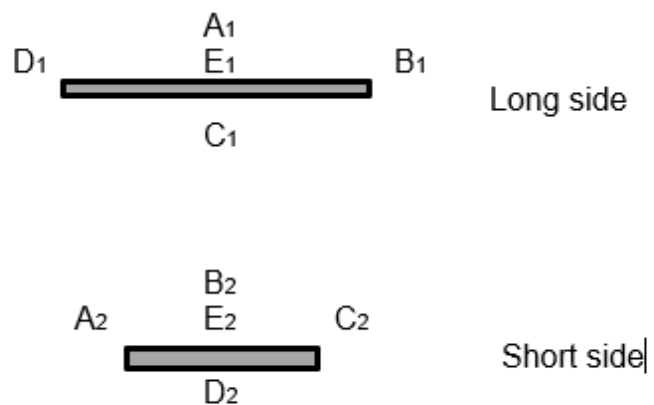
How do you explain the data?

Horizontal source. Evaluate LEL at the different positions (A_{1&2} through E_{1&2}) shown below. A₁ is one inch above the surface at the perimeter edge; A₂ is 6 inches above the surface and the A₁ position. Record your results on the next page.

View from top



View from sides (examples)



Air movement (if any) →

Location	LEL (%) Reading	O ₂ (%) Reading
A ₁		
A ₂		
B ₁		
B ₂		
C ₁		
C ₂		
D ₁		
D ₂		
E ₁		
E ₂		

Exercise – Measuring Concentration #2

Station 1. Calibration

Check the calibration of the instrument you have been given. If not in acceptable limits, calibrate the meter.

Station 2. Colorimetric Tubes

Leak check the pump and review use of tubes.

Identify and quantify the chemical(s) in the bag assigned to your group, using the colorimetric tubes and a 4-gas meter. Below, keep notes on what you learn from each 'test', as well as our final answer.

Station 3. Response Factor

1. Measure the concentration of hexane in the bag using a colorimetric tube.
_____ ppm
2. Measure the concentration of hexane using the PID provided.
_____ ppm
3. Calculate the 'response factor'

$$\text{RF} = \frac{\text{colorimetric tube concentration}}{\text{PID concentration}}$$

Station 4. Static Room

Monitor the toluene concentration at the three ports in the 'room'. Complete the table below:

	LEL	O ₂	PID	Col. Tube
Port 1				
Port 2				
Port 3				

How do you explain the data?

Exercise – Air Monitoring Instrument

Your group will be given a bag containing gas(es) of unknown name and concentration. Using the instruments and manuals provided, complete the worksheet below for Bag identifier/label _____

Multi-gas monitor: make _____ model _____

Response

Flammables: _____ O₂ _____ CO _____

PID: make _____ model _____

Response _____

Detector tubes

Hexane _____ CO _____

Alcohols _____ Ammonia _____

Relative Response Calculations (show work)

Identified content(s) and concentration(s):

Name: _____

Monitoring Performance Checklist

Instrument: _____

I completed the following:

- | | | |
|-----------------------------------|------------------------------|-----------------------------|
| Calibration | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Measurement | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Calculation | <input type="checkbox"/> yes | <input type="checkbox"/> no |
| Described or explained the result | <input type="checkbox"/> yes | <input type="checkbox"/> no |

Date _____ Instructor's Signature: _____

Work Practices

Depending on the types of actions you may be expected to conduct during a response, the facilitator will select one of the following exercises to practice various tasks or decision making.

The needed information and/or supplies will be provided.

Exercise – Spill Control

You will work in small groups. Each group will have absorbents and a bucket for water.

Background:

1 gallon of water weighs approximately 8 pounds

Determine the following for the absorbent(s) you are provided, using manufacturer information:

Identify the absorption rate/ratio

Calculate the amount of absorbent you will need to build a dam or dike; build it.

Determine amount absorbed.

Did the dam or dike contain the spill?

Compare results between the groups in a report back.

Exercise – Patching and Plugging

Performance Checklist

Name _____

Did you...

- 1. Review an SOP/SOG? Yes No
- 2. Select appropriate materials from available supplies? Yes No
- 3. Inspect the container for condition? Yes No
- 4. Inspect the container for labels? Yes No
- 5. Inspect PPE before use Yes No
- 6. Don proper PPE? Yes No
- 7. Work in a manner to limit contamination? Yes No
- 8. Maintained Buddy System or communication? Yes No
- 9. Go through decon? Yes No

What actions could you have taken that would have further reduced contamination?

Date _____ Instructor's Signature: _____

Exercise – Confined Space Permits

Performance Checklist

Name _____

Permit # Is entry permissible? Justify your answer

1. Yes No

2. Yes No

3. Yes No

4. Yes No

Date _____ Instructor's Signature: _____

Exercise – Overpacking

Performance Checklist

Name _____

Did you...

1. Review an SOP/SOG? Yes No
2. Select appropriate materials from available supplies? Yes No
3. Inspect the container for condition? Yes No
4. Inspect the container for labels? Yes No
5. Inspect PPE before use? Yes No
6. Don proper PPE? Yes No
7. Work in a manner to limit contamination? Yes No
8. Maintained Buddy System or communication? Yes No
9. Go through decon? Yes No

What actions could you have taken that would have further reduced contamination?

Date _____ Instructor's Signature: _____

Decontamination

Exercise – Setting up a Decon Line

During this exercise you will set up a decon line for a specific response provided by the facilitator. You will work as a group.

A performance checklist is provided.

Performance Checklist—Decon set up

Name _____

Did you...

- 1. Receive a briefing? Yes No
- 2. Select appropriate materials from available supplies? Yes No
- 3. Inspect the supplies for condition? Yes No
- 4. Identify expected wind direction? Yes No
- 5. Consider various factors in determining the best site? Yes No

- 6. Identify level of PPE for decon line workers? Yes No
- 7. Place systems to collect water/decon solutions? Yes No
- 8. Place barrels for contaminated waste? Yes No
- 9. Consider safety of those being deconned? Yes No

What actions could be taken to further reduced spread of contamination?

Date _____ Instructor's Signature: _____

Rights and Responsibilities

Exercise – Worker and Employer Rights and Responsibilities

The following set of questions is intended to see how much you already know about worker and employer safety and health rights and responsibilities. For each of the following questions, answer “True” (“T”) or “False” (“F”), using your current understanding of the law. Your facilitator will review the correct answer to each of these questions at the end of this section.

- T or F 1. The employer must pay for all health and safety equipment required by OSHA standards.
- T or F 2. OSHA can fine workers for violating OSHA standards.
- T or F 3. The employer has the right to discuss apparent violations with the government agency responsible for OSHA compliance.
- T or F 4. OSHA violations can be issued when workplace hazards are causing serious physical harm.
- T or F 5. If OSHA conducts an inspection of the work site, the union or employee representatives must be paid for time they spend on the walk-around, according to OSHA regulations.
- T or F 6. OSHA has the right to enter the workplace and conduct an inspection at any time, whether the employer wants it or not.
- T or F 7. The “general duty clause” can be used by OSHA if a serious hazard exists but no specific safety and health standard covers the problem.
- T or F 8. According to the OSHAct, the employer and the employees have an equal duty to provide a safe and healthful workplace.
- T or F 9. If employers receive an OSHA citation, they must appeal it within a certain number of days or the citation becomes final.
- T or F 10. The OSHA 300A form must be posted during the months of February, March, and April and presents the annual summary of recordable employee injuries.

Exercise – Using Rights and Responsibilities

You are a member of an employer-employee safety and health committee. The committee has decided to review all employer safety and health programs to make certain that they meet or exceed all existing safety and health regulations. You have made up a list of questions or concerns, and your job is now to check them out and report back to the entire committee. Work in small groups to complete the following:

1. What agency and regulations might govern respirators for emergency response?
2. Your facility is located near a Great Lake port. Who would you notify if an accidental release occurred?
3. You drive into the facility during off hours and see that a pallet of 55-gallon drums has fallen and contents are leaking into the sewer. What is your first action? Why?
4. List two OSHA regulations that include training of emergency responders.
5. Where will Safety Data Sheets be kept to allow responder access?
6. Which emergency responders must receive medical examinations, and who pays for them?
7. To what safety and health records does an employee have access upon request?
8. List the agency you would contact to help control the following possible releases/emergency:

Trucks entering without proper documentation

Particles from a very black plume exiting a nearby facility are falling on your raw material and you are concerned about fouling

Requirements for working on a pond

Uncovered waste with some containers showing a radiation symbol

Emergency Response

Tabletop Exercise

The facilitator will distribute worksheets for a Tabletop exercise designed for teams to work together to think through a simulated response from initial alert to termination. Space is provided in the materials so that your group can insert answers.

Level A or B Simulation

Exercise – Level A or B simulation with full Decon

In this exercise you will lay out a decon line and conduct decon. Activities include:

1. Don and Doff Level A or B as a member of the response team.
2. Don and Doff Level B or C PPE as a member of the decon team.
3. Inspect PPE.
4. Go through a decon line and perform an assignment in the response.

Performance Checklists for Decon and an Assignment are provided on the following pages. However, the facilitator may hand out a duplicate for you to complete, have signed by the facilitator, and turn in at the end of the workshop.

The training center retains this information with your other training records. Therefore, you may want to record your lab results separately for your personal records.

Name _____

Buddy's Name _____

Decon Performance Checklist: Decon line

Think about when you were on the decon line, then answer the following questions by checking the appropriate line.

1. Was all of the needed decon equipment assembled? Yes No
2. Was the decon team ready when the response team arrived? Yes No
3. Did all of the equipment work properly? Yes No
4. Were decon workers wearing appropriate level(s) of protection? Yes No
5. Did the decon team stay in communication with the responders? Yes No
6. Did the response team follow the decon team's instructions? Yes No
7. Were all response team members fully decontaminated? Yes No
8. Were wastewater and materials controlled? Yes No
9. Were the reusable supplies and equipment decontaminated? Yes No
10. Did decon team self-decontaminate before leaving the area? Yes No

Date _____ Instructor's Signature: _____

Name _____

Buddy's Name _____

Performance Checklist: Completing my assignment in a response

My assignment: _____

1. I had all the supplies/equipment needed Yes No

If 'no', explain:

2. Questions I asked about my assignment were answered clearly Yes No

If 'no', explain:

3. I had support from other members of the response team. Yes No

If 'no', explain:

4. My training was used in my assignment? Yes No

If 'no', explain:

5. I was able to complete my assignment safely? Yes No

If 'no', explain:

Date _____ Instructor's Signature: _____

Emergency Response Simulation

Exercise – Emergency Response Simulation

In this simulated response, the group will rotate through selected tasks and work stations.

A Performance Checklist for this exercise is provided on the following page. However, the facilitator may hand out duplicates for you to complete, have signed by the facilitator, and turn in at the end of the workshop.

The training center retains this information with your other training records. Therefore, you may want to record your lab results separately for your personal records.

Name: _____

Buddy's Name: _____

Performance Checklist: Emergency Response Simulation

1. I wore the following levels of protection

- | | |
|---|--|
| A | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| B | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| C | <input type="checkbox"/> Yes <input type="checkbox"/> No |

2. I completed the following assignments

- | | |
|--------------|--|
| Plug/patch | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Over pack | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Other _____ | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Decon worker | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Was deconned | <input type="checkbox"/> Yes <input type="checkbox"/> No |

3. I reviewed the following

- | | |
|-------------------------|--|
| SOP/SOG for activity | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Emergency Response Plan | <input type="checkbox"/> Yes <input type="checkbox"/> No |

4. One action I could have taken to reduce contamination spreading at the response site is _____

5. One action I could have taken to reduce contamination in decon is _____

Date _____ Instructor's Signature: _____

Clean up and Critique (Termination)

Exercise – Termination

At the conclusion of the HAZMAT response termination procedures assure that lessons learned are captured for future action, required reports are filed and supplies are inspected and resupplied.

A performance checklist is shown on the following page.

Performance Skills Checklist—Termination

Name _____

Activity

1) Did you resupply equipment?

- a) Suit Yes No
- b) Gloves Yes No
- c) Boots Yes No
- d) Hard Hat Yes No
- e) Tape Yes No
- f) Decon Bags/Pads Yes No

2) Did you inspect the following equipment before putting it in the inventory?

- a) Suit Yes No
- b) Gloves Yes No
 - i) Outer Yes No
 - ii) Inner Yes No
- c) Boots Yes No
- d) Hard Hat Yes No
- e) Tape Yes No
- f) Decon Bags Yes No
- i) Plug/patch supplies Yes No
- j) Neutralizing solution/decon additives Yes No

3) Was the decon line disassembled? Yes No

4) Were any extra boxes inspected? Yes No

5) Were all materials and equipment returned to storage? Yes No

6) Did you participate in Debriefing? Yes No