Anhydrous Ammonia Emergency Responder Participant Exercise Manual

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Chemical Properties of Ammonia

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

Use the NIOSH Pocket Guide to find information on the properties of ammonia. Complete the Worksheet on the next page.

During the report back and discussion, identify which properties of ammonia raise the most concern to you as a responder. Why?

Worksheet – Using the NIOSH Pocket Guide to find Chemical Properties

Chemical Name: Ammonia

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?

Exercise – Using Resources to find Health Effect Information

Use the resources provided to find information on the effects of exposure to ammonia. Complete the Performance Checklist on the next page.

During the report back and discussion, identify which effects of exposure to ammonia raise the most concern to you as a responder. Why?

Name_____

Performance Checklist - Using Resources to find Health Effect Information

Chemical Name: Ammonia

What are the routes of entry?

List the symptoms of exposure

Which symptoms are related to local effects?

Which symptoms are related to systemic effects?

List the target organs that may be affected

Is this chemical a carcinogen?

Is this chemical a mutagen?

Is this chemical an allergen/sensitizer?

Date _____ Instructor's Signature_____

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 that follow demonstrations of donning/doffing and evaluations of fit:

1. User checks of an APR
2. Donning and doffing APR with supplied air bottle (SCBA)
3. Inspecting and cleaning respirators
4. Wearing an airline with escape unit (optional)

Performance Checklists for these activities 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 results separately for your personal records.

Name_____

Performance Checklist - User checks for 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 user check? ☐ Yes ☐ No

   If NO, why?

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

   If NO, why?

4. What brand and size of full-face, air-purifying respirator did you wear?

   Brand _____Size _____

Date _____ Instructor's Signature_____

Name_____

Performance Checklist - 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 user check.

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

…continued next page

Name_____

Performance Checklist - Donning and Doffing an SCBA (page 2):

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 _____

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 _____

Performance Checklist - Wearing an Air Line 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 air-line egress unit.

   ☐ A ☐ B ☐ C

Date _____ Instructor's Signature_____

CPC Workshop

The purpose of this workshop is to give you the opportunity to identify the level of protective clothing needed for several scenarios and to wear levels of protection This workshop includes one exercise and four activities:

Levels of Protection

Level C Dressout
- PPE Checkout
- Donning and Doffing Level C

Level B Dressout, Donning and Doffing Level B
Level A Dressout, Donning and Doffing Level A

A Worksheet for the Levels of Protection exercise and Performance Checklists for the activities are provided on the following pages. However, the facilitator may hand out duplicates of the Performance 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 results separately for your personal records.

Worksheet - Levels of Protection

In small groups, discuss the situations described below and identify the level of protection that is required. Your facilitator or your group may substitute scenarios more relevant to your work assignments or add examples.

1. An alarm set to alert residents of ammonia concentrations of 5 ppm has sounded at the perimeter of a plant where peas and other vegetables are frozen. What level of protection do you wear to check the perimeter station?

2. 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?

3. More than 400 gallons of ammonia were released when a rooftop valve failed. It has been repaired by responders and the response team and back-up team are now at the decon line. What level of protection is required for the decon workers?

4. During a delivery of ammonia, a breach in the transfer line resulted in release. What level of protection is needed for responders?

5.

6.

Level C Dressout

The purpose of this activity is to give you the opportunity to Checkout 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 lab results separately for your personal records.

Name _____

Buddy's Name _____

Performance Checklist - Level C Checkout

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. 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 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 _____

Name_____

Performance Checklist - Donning and Doffing Level C

1. List the size that you chose for all 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 of smaller size.

   Type of Equipment _____Larger/Smaller_____

   Type of Equipment _____Larger/Smaller_____
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 _____

Level B Dressout

The purpose of this activity 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 lab results separately for your personal records.

Name _____

Buddy's Name _____

Performance Checklist - Donning and Doffing Level B

1. List the size that you chose for all 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 of smaller size.
   Type of Equipment _____Larger/Smaller_____
   Type of Equipment _____Larger/Smaller_____
   Type of Equipment _____Larger/Smaller_____
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_____

Level A Dressout

The purpose of this activity 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 lab results separately for your personal records.

Name _____

Buddy's Name _____

Performance Checklist - Donning and Doffing Level A

Preparing to Don the Equipment

1. List the size that you chose for all 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 of smaller size.

Type of Equipment _____ Larger/Smaller_____

Type of Equipment _____ Larger/Smaller_____

Type of Equipment_____ Larger/Smaller_____

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

Donning the Equipment

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

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

…continued next page

Name _____

Buddy's Name _____

Performance Checklist - Donning and Doffing Level A (page 2)

On air

7. Did your buddy check your suit 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 turn on the SCBA emergency by-pass valve? ……☐ Yes ☐ No

10. Did your facepiece fog? ☐ 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 ask that it be changed? ……..……..☐ Yes ☐ No

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

Date _____ Instructor's Signature _____

Material Identification

Identifying Information on System Labels and finding information

The purpose of the exercise and activity in this section is to find information. One exercise is shown; in addition, the facilitator will select one of three activities to be used to document ability to find information using resources. The following pages show a worksheet for the system labels; for the information activity, a copy of the Performance Checklist is provided by the facilitator for you to complete. The training center retains this Checklist with your other training records, so you may want to record your answers separately for your personal use later.

Exercise: Identifying information on system labels

Activity: Using the ERG (or)

Finding safety and health information on an SDS (or)

Finding safety and health information using electronic resources

Worksheet - Identifying information on system labels

Your facilitator will provide several labels. Use the IIAR table and explanation in the Participant Guide or employer information to complete the worksheet. Work in small groups; be prepared to report back to the group.

		Info/Value provided	Meaning
Label 1			
	Process step	_____	
	Physical form	_____	
	Pressure	_____	
	Direction of flow	_____	
Label 2			
	Process step	_____	
	Physical form	_____	
	Pressure	_____	
	Direction of flow	_____	
Label 3			
	Process step	_____	
	Physical form	_____	
	Pressure	_____	
	Direction of flow	_____	
Label 4			
	Process step	_____	
	Physical form	_____	
	Pressure	_____	
	Direction of flow	_____	

Activity – Using the ERG

Your facilitator will provide scenario(s). Enter the facts on the worksheet and work in small groups to identify isolation distances for the scenario. Be prepared to report back to the group.

Name or Group ID_____

Performance Checklist - Using the ERG to determine isolation distance

Scenario 1 facts

Isolation distance

Scenario 2 facts

Isolation distance

Scenario 3 facts

Isolation distance

Date _____ Instructor's Signature_____

Finding Safety and Health Information, SDS

Your facilitator will provide an SDS for ammonia. Use the SDS to complete the information requested in the worksheet on the next page.

Name or Group ID _____

Performance Checklist – Information in an SDS

Name of hazardous material - Ammonia_____

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?		
Are special tools needed?		
Is there a contact, if needed?		
What is the product of combustion?		
Is there an acute health effect?		
What action is need if someone is splashed on the skin?		

Date _____ Instructor's Signature_____

Finding Safety and Health Information, Electronic Resources

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.

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 ICS?
- 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?

Gather Information

Using the online resources, spend about 30 minutes completing the assigned part of the Performance Checklist on the next four pages for the following scenario: Your emergency response team has been called because of alarms sounding indicating high ammonia concentrations. The supervisor indicates that a 400-gallon container of ammonia has developed a significant leak around the 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. The temperature in the release area is -20ºF.

Haz-Mat Staff Positions - page 1 of 4 Name or Group ID _____

Haz-Mat Director _____
Safety Officer _____
Decon Officer _____
Monitoring Officer _____
Science Officer _____
EMS Officer _____
Hazmat Radio Channel _____

Incident Commander _____
Finance/Admin._____
Logistics _____
Operations _____
Planning _____
Safety_____
All other On-Site Radio Channel _____

Hazardous Substance Information

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: ↑☐ Y ↑☐ 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: □ Y □ N			
Explosion Potential: □Y □N			
Toxic Products of Combustion:			
Extinguishing Agents:			
Other: _____			

Reactivity Properties: □ Yes □ No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
Pyrophoric: □ Yes □ No			
Explosive: □ Yes □ No			
Polymerization: □ Yes □ No			
With what other Chemicals?			
Other: _____			

Corrosive Properties: □ Yes □ No

Reference Sources:	#1: _____ Page: _____	#2: _____ Page: _____	#3: _____ Page: _____
Skin: □ Yes □ No			
Metal: □ Yes □ 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: □ Yes □ No			
Ingestion: □ Yes □ No			
Skin Absorption: □ Yes □ No			
Eye Absorption: □ Yes □ No			
Carcinogen: □ Yes □ No			
Teratogen: □ Yes □ No			
Mutagenic: □ Yes □ No			
Aquatic: □ Yes □ 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:

Date _____ Instructor's Signature_____

Monitoring

You will work in small groups to complete parts of the following monitoring exercises; the selection of the appropriate exercises will be made by the facilitator, based on equipment you have available at the workplace or expected response needs. Space is provided to record your results for the following activities:

Bump test and Follow up
Detecting and Measuring
Measuring Oxygen, LEL, pH, RGasD
And during a Demonstration of NH_3 Contamination on Clothing

Data collection forms are shown for each of the activities. An overall Performance Checklist is provided to document skills. A worksheet is provided to record measurements taken during the demonstration. A copy of the Performance Checklist will be provided by the facilitator for you to complete. The training center retains this Checklist with your other training records, so you may want to record your answers separately for your personal use later.

Discussion will follow.

Data Collection Form - Bump test and Follow-up Group ID _____

Option A. Multi-gas meter

Review the operation of the meter and then follow procedures for a bump test.

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

LEL %	% O_2	Ammonia (ppm)	CO (ppm)	Other (show units)

Compare results with expectations. Is the bump test sufficient?

What follow up is needed based on the worksite Monitoring Procedures (SOP)?

Option B. Multi-gas meter with docking station

Review the operation of the meter and then follow procedures for a bump test.

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

LEL %	% O_2	Ammonia (ppm)	CO (ppm)	Other (show units)

Compare results with expectations. Is the bump test sufficient?

What follow up is needed based on the worksite Monitoring Procedures (SOP)?

Option C. Ammonia monitor

Review the operation of the meter and then follow procedures for a bump test.

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

LEL %	% O_2	Ammonia (ppm)	CO (ppm)	Other (show units)

Compare results with expectations. Is the bump test sufficient?

What follow up is needed based on the worksite Monitoring Procedures (SOP)?

Data Collection Form – Detecting and Measuring Group ID _____

Station 1. Colorimetric Tubes

Leak check the pump and prepare the tube(s) for use. Using the same bag provided for the bump test exercise, determine the ammonia concentration using colorimetric tubes and record in the table below.

Ammonia (ppm)	Tube #1	Tube #2	Tube #3

Station 2. PID

Using the same bag provided for the bump test exercise, determine the ammonia concentration using the PID and record the results in the table below.

Ammonia (ppm)	Test #1	Test #2	Test #3

Station 3. Ammonia monitor

Using the same bag provided for the bump test exercise, determine the ammonia concentration using the meter and record the results in the table below.

Ammonia (ppm)	Test #1	Test #2	Test #3

If you assume the colorimetric tubes are the 'gold standard' (most accurate), calculate a correction factor for the other instruments used, as

$$CF = \frac{\text{colorimetric tube concentration (ppm)}}{\text{another result (ppm) concentration}}$$

Corrected value = CF x result

Compare the corrected values for the instruments used in this exercise.

Are these instruments examples of detect or measure?

Data Collection Form – Measuring Oxygen, LEL, pH, RGasD Group ID_____

Station 1. A test atmosphere will be provided in a ventilated hood. Using the instruments provided, complete the table below, showing NA as appropriate.

Method	LEL %	% O_2	Ammonia (ppm)	CO (ppm)	Other (show units)
O_2/LEL meter					
Colorimetric tube					
Multi-gas meter					
Ammonia meter					

Station 2. pH

Using the atmosphere provided, measure the pH in the water reservoir and in a container of ammonia hydroxide.

Record the results below:

Reservoir pH =

Ammonia hydroxide pH =

Station 3. RGasD

Measurements will be made at sampling ports in a vertical tube. Review ladder safety as preparation to collect data. Record the results in the table below:

Method 1		Ammonia (ppm)	Time after release (seconds)
	Top port		
	Middle port		
	Bottom port		

Method 2		Ammonia (ppm)	Time after release (seconds)
	Top port		
	Middle port		
	Bottom port		

How do you explain the data?

_____

_____

Demonstration Worksheet - NH_3 Contamination on Clothing

Data Collection Form

Your facilitator will provide a container with a sampling port. Inside the container is a shirt or towel and a source of ammonia. The container has been setting for about 30 minutes so most/all the ammonia will be a gas.

In a hood or outside from upwind, measure the concentration of ammonia and record below:

From the port, prior to opening:	ppm
Above the towel/shirt at removal:	ppm
2-3 minutes after the first measurement:	ppm
2-3 minutes after the second measurement:	ppm

Name _____

Performance Checklist - Monitoring

Instrument(s): _____

I completed the following:

Calibration	☐yes	☐no
Measurement	☐yes	☐no
Calculation	☐yes	☐no
Described or explained the result	☐yes	☐no

Date _____ Instructor's Signature _____

Work Practices

Depending on the types of action(s) you may be expected to conduct during a response, the facilitator will select one or more of the following activities.

Spill Control

LOTO

Plug/Patch

Performance Checklists are shown for each. A copy of the Performance Checklist will be provided by the facilitator for you to complete. The training center retains this Checklist with your other training records, so you may want to record your answers separately for your personal use later.

The needed information and/or supplies will be provided.

Activity - Spill Control
(Prevent a Release from Entering Drain/Sewer)

Performance Checklist Name _____

Did you…

1. Review an SOP/SOG? ☐ Yes ☐ No
2. Select appropriate materials from available supplies? ☐ Yes ☐ No
3. Inspect the area for condition? ☐ Yes ☐ No
4. Identify any 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?

_____

What information or practice would have improved your response?

_____

Date _____ Instructor's Signature _____

Activity – Patching and Plugging (Stopping a Release)

You will work in groups to stop a release. This might involve a valve or a process line where it is necessary to go to the point of release to perform actions to stop the release. The facilitator will describe the release and provide tools and PPE from which to choose. Conduct the task and complete the Performance Checklist.

Performance Checklist Name _____

Did you…

1. Review an SOP/SOG? ☐ Yes ☐ No
2. Select appropriate materials from available supplies? ☐ Yes ☐ No
3. Inspect the area for condition? ☐ Yes ☐ No
4. Identify any 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?

_____

What information or practice would have improved your response?

Date _____ Instructor's Signature_____

Name or Group ID _____

Activity – Lock out/Tag out (LOTO)

Look back at the types of responses that were described for your plant in the Levels of Protection Exercise. Work in small groups to identify one or more situations in these responses where the control of energized systems is needed to protect responders. If a LOTO SOP from your plant is available, use it to complete the worksheet below. If none is available at the training session, complete an SOG provided by the facilitator, and use it to complete the worksheet. Be prepared to participate in a report back.

	Name/location/action	Not known
System or machine that must be locked out		
Who notifies responsible party?		
Location of the locks		
Who is responsible party?		
How are responders notified that LOTO complete?		
Is there a backup if person with lock is injured?		
Who notifies responsible party to remove locks?		
Who notifies affected employees that system is energized?		
Where is the SOP?		

Date _____ Instructor's Signature _____

Exercise – Setting up a Decon Line

During this exercise you will set up a decon line for a specific response described by the facilitator. You will not don PPE for the exercise. You will work as a group.

A Performance Checklist is provided. A copy of the Performance Checklist will be provided by the facilitator for you to complete. The training center retains this Checklist with your other training records, so you may want to record your answers separately for your personal use later.

Name _____

Performance Checklist - Decon set up

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 _____

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 that will be used in the discussion that follows.

A Performance Checklist is provided. A copy of the Performance Checklist will be provided by the facilitator for you to complete. The training center retains this Checklist with your other training records, so you may want to record your answers separately for your personal use later.

Name _____

Performance Checklist - Tabletop Exercise

What actions were taken to reduce risk of exposure?

What decisions did not result in minimizing exposure?

What additional information would have been useful?

The two most important things I learned by doing this Tabletop were:

1.

2.

Other comments

Date _____ Instructor's Signature _____

Exercise – Level A or B simulation with full Decon

In this exercise you will work with a buddy to dressout and conduct activities in a technician-level ammonia response simulation. 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. Perform an assigned role or activity
5. Go through a decon line.

Performance Checklists for Assigned Role, Decon and Role in Response Feedback are provided on the following pages. A copy of the Performance Checklist will be provided by the facilitator for you to complete. The training center retains this Checklist with your other training records, so you may want to record your answers separately for your personal use later.

Name _____
Buddy's Name _____

Performance Checklist - Assigned role in Emergency Response Simulation

1. I wore the following levels of protection

A	☐ Yes ☐ No
B	☐ Yes ☐ No
C	☐ Yes ☐ No

2. I completed the following assignments

LOTO	☐ Yes ☐ No
Stopped release	☐ Yes ☐ No
Prevented spread of release	☐ Yes ☐ No
Other _____	☐ Yes ☐ No
Decon worker	☐ Yes ☐ No
Was deconned	☐ Yes ☐ No

3. I reviewed the following

SOP/SOG for activity	☐ Yes ☐ No
Emergency Response Plan	☐ Yes ☐ 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 _____

Name_____

Buddy's Name_____

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 role in a response feedback

My assignment: _____

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

If 'no', explain:

2. Questions I asked about my role 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 _____

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 provided. A copy of the Performance Checklist will be provided by the facilitator for you to complete. The training center retains this Checklist with your other training records, so you may want to record your answers separately for your personal use later.

Name_____

Performance Skills Checklist - Termination

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 returning it to the inventory?

a) Suit ☐ Yes ☐ No
b) Gloves
    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) Tools/wrenches ☐ 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

if no, list those tagged for repair or removal

_____

_____

_____

6) Did you participate in Debriefing? ☐ Yes ☐ No

Date _____ Instructor's Signature _____