

Exposures measured at your workplace

Time Requirement: 1.5 hours

Number of Instructors: 1 or more, consistent with ratio shown in Minimum Criteria

Materials

- Participant Guide and worksheets
- Whiteboard or equivalent; markers
- NIOSH Pocket Guides for each small group and/or electronic version
- TLV booklet for each table
- Resource for sampling and analytical methods
- Monitoring report of results

Objectives

When completed, participants will be better able to:

- Identify limits and levels for exposure(s) measured in your workplace
- Review a report of monitoring results
- Identify jobs or tasks where exposures may occur

Teaching Methods

- Discussion/Small-group activity

Suggested Instructor Preparation

- Review the Participant Guide and exercises.
- Review OSHA standards 29CFR1910.120, especially (c), (d), (f), (g), (h), (p), (q); 29CFR1910.146; 29CFR1910.1000.
- Test web links prior to the session and if any are inoperative please notify your Program Director
- Review the Monitoring chapter in the HAZWOPER program completed by participants.
- Review OSHA standard 1910.1000, Air Contaminants, where PELs are listed.
- Review OSHA standard 1910.1020, Access to employee exposure and medical records.
- Conduct reconnaissance: was monitoring done last year? with what devices? Obtain a report of results (lab report or listing of direct reading instrument results done in-house; may need to blank out names etc). If none are available use tools in the Appendix to this guide.
- Ensure you are familiar with the sampling equipment used for monitoring cited in the report of results.
- Prepare agenda and class notes for this part of the refresher; put copy in the program file.
- Copy Worksheets for each exercise.
- Ensure that you have assembled all the materials needed for the exercise.

Minimum Content Requirements

- Review objectives
- Review hazards monitored during past year
- Review terms
- Review exposure results as part of medical records
- Find information on a report of monitoring results
- Identify other jobs or tasks where this exposure may occur

Questions You May Be Asked

1. You should be prepared to discuss safe confined-space entry (CSE) procedures. Be prepared to describe the actions an employee may take if directed to enter a space which she/he feels is unsafe. For contract programs, the CSE program should be reviewed prior to presenting this module. For open enrollment, general approaches of working through union or company health and safety officers should be discussed. You must be aware of the consequences of refusal to work.

2. Participants may question whether adequate monitoring is done on a routine and/or emergency basis. For contract programs, reconnaissance will provide you with information about the facility's monitoring program and equipment.

3. Access to monitoring information may not be routine at many facilities. How to request this information and what to do with it (keep it with personal medical records, provide it to private or union occupational medical doctor) should be discussed.

Presentation of the Session

This session can be presented as follows:

Review objectives

Review definitions of exposure limits

Monitoring in the Workplace

This section is a review and can be done by reference to the handout.

Tailor your review of OSHA requirements for sampling to what you learned during reconnaissance for a contract program.

If you are using this in open enrollment, it may be best to begin with the questions on page 3 of the Participant Guide:

During the past year:

Was your exposure monitored (wear a device or in your breathing zone)?

Did you observe monitoring in the work area?

Did you conduct monitoring?

This will provide you with a context to review/discuss the basics on page 2 of the Participant Guide and refer to additional standards, as appropriate. List responses where everyone can see to assist in the review of terms, and the summary at the end of the module.

Exposure Records

Ask: Have you asked for copies of exposure records?

Ask: Have you provided your health care provider with a copy?

Exposure Limits

Review the importance of OSHA as the agency that provides legally-enforceable exposure limits.

Refer to the handout for measures of concentration, and other terms.

Review the TWA calculation on page 5 of the Participant Guide. It may be useful to discuss how to use these limits for the full work shifts (TWA) and emergency response (C, STEL, IDLH).

Ask: Which of these types of limits apply to long-term exposure?

Ask: Which of these apply to short-term exposure?

Exercise - Exposure Limits and Levels

Distribute the Worksheets. Provide the name of one or more of the exposures monitored at the workplace during the past year. Have participants use resources to complete the exercise.

Facilitate a report back, and post results for each chemical

Exercise - Exposure Monitoring Information in a Report

Distribute exposure monitoring report(s) from the company where participants are employed or the generic reports shown in the Appendix to this Facilitator Guide. A site worker and ERR examples are provided.

Distribute the Worksheet for participants to complete.

Exercise - Mapping Exposures Measured to Jobs or Tasks

Have participants work in small groups to discuss:

- Other locations where the exposure reported in the previous exercise may occur
- What jobs or tasks may result in exposure
- Are they aware if any of these jobs/tasks have been assessed
- Are control measures (engineering, administrative PPE) in place to reduce exposure, if needed

Facilitate a report back.

Summary

Review the objectives.

Ask: Based on this exercise, what takeaways do you have as you go back to work?

List them where everyone can see

Answer any remaining questions.

Follow-up

Make this exercise better:

Forward suggestions to your Program Director

Are there other 'Questions you may be asked' that should be included?

Organize the listing of 'takeaways' and forward to your program director. These are very important impacts to report to NIEHS.

Exercise - Exposure Limits and Levels Worksheet

Participant I.D.: _____ Exposure Measured: _____

Complete the following table:

Limit	Numerical Value (with units)
NIOSH TWA	
NIOSH ST	
NIOSH C	
OSHA TWA	
OSHA ST	
OSHA C	
IDLH	
TLV TWA (if resource available)	
Other (specify) _____	

Recommended measurement method: _____

Collection media: _____

Flow rate (with units): _____

Date _____ Instructor's Signature: _____

Exercise - Exposure Monitoring Information in a Report

Participant I.D.: _____ Exposure Measured: _____

Complete the following table:

Limit	Analytical Result (with units)	Refer to levels in previous exercise: Exceeded? Yes, No, not Applicable
NIOSH TWA		
NIOSH ST		
NIOSH C		
OSHA TWA		
OSHA ST		
OSHA C		
IDLH		
TLV TWA (if resource available)		
Other (specify) _____		

Expected collection media? Yes ___ No ___

Expected flow rate? Yes ___ No ___

Date _____ Instructor's Signature: _____

Appendix

Air Sampling Forms

Air Sampling Worksheet – Lead at a Hazardous Waste Site (2 pages)

Air Sampling Worksheet – Blank to be filled in (2 pages)

Confined Space Entry Permit (2 pages)

Health and Safety Officer Report regarding spill (1 page)

Air Sampling Worksheet

Sampling Date Sept 15		Shipping Date Sept 17	
Person Performing Sampling (Signature) <i>Seminar</i>		Print Last Name Seminar	
Employee Ima Worker		Exposure Information	a. Number 10 others b. Duration full shift
		Frequency daily	
Job Title Equipment Operator		Weather Conditions overcast 60°F	Photo(s) —
PPE (Type and Effectiveness) none for dust		Pump Checks and Adjustments 7:40 and hourly.	
Job Description, Operation, Work Location(s), Ventilation and Controls load and unload potentially contaminated soil at pit 4 no mechanical ventilation, enclosed cab <div style="float: right; text-align: right;"> 8:44, 9:50, 10:43, 11:59, 13:45, 13:48. No adjust needed. </div>			
Pump Number: 1376		Sampling Data	
Lab Sample Number	1376		
Sample Submission Number	Tues 01		
Sample Type	filter		
Sample Media	MCE		
Filter/Tube No.	01		
Time On/Off	7:10 a.m.	13:15	
	12 noon	14:58	
Total Time (in minutes)	290	103	
Flow Rate <input checked="" type="checkbox"/> l/min <input type="checkbox"/> cc/min	2.0	2.0	
Volume (in liters)	→ 393		
Net Sample Weight (in mg)			
Analyze Samples for:	Indicate Which Samples to Include in TWA, Ceiling, etc. Calculations		
	→ Lead		
Interference and IH Comments to Lab		Supporting Samples —	
		a. Blanks: one filter/cassette submitted Tues 02	
		b. Bulks: —	

Pre-Sampling Calibration Records						
P R E	Pump Mfg. & SN SKC 2777		Flow Rate Calculations			
	Voltage Checked? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		1 l in 30 seconds (2x)			
	Location/T & Alt.		Flow Rate 2.0	Method <input checked="" type="checkbox"/> Bubble <input type="checkbox"/> PR	Initials CW	Date/Time 6am 9/15
Post-Sampling Calibration Records						
P O S T	Location/T & Alt. same procedure back at office		Flow Rate Calculations			
	Flow Rate 2.0		Initials CW		Date/Time 4 p.m. 9/15	
Sampling Weight Calculation						
Filter No						
Final Weight (mg)						
Initial Weight (mg)						
Weight Gained (mg)						
Blank Adjustment						
Net Sample Weight (mg)						

Calculations and Notes

NIOSH Method 7082

mass Pb 23 µg

CONCENTRATION:
$$\frac{23 \mu\text{g}}{393 \times \frac{1 \text{ m}^3}{1000 \text{ L}}} = 58.3 \mu\text{g}/\text{m}^3$$

Lab analyst: Al Wright

Reviewed: Jay Chemist JC
9/22

Air Sampling Worksheet (blank)

Sampling Date		Shipping Date			
Person Performing Sampling (Signature)		Print Last Name			
Employee		Exposure Information	a. Number	b. Duration	
		Frequency			
Job Title		Weather Conditions	Photo(s)		
PPE (Type and Effectiveness)		Pump Checks and Adjustments			
Job Description, Operation, Work Location(s), Ventilation and Controls					
Sampling Data					
Pump Number:					
Lab Sample Number					
Sample Submission Number					
Sample Type					
Sample Media					
Filter/Tube No.					
Time On/Off					
Total Time (in minutes)					
Flow Rate <input type="checkbox"/> l/min <input type="checkbox"/> cc/min					
Volume (in liters)					
Net Sample Weight (in mg)					
Analyze Samples for:	Indicate Which Samples to Include in TWA, Ceiling, etc. Calculations				
Interference and IH Comments to Lab	Supporting Samples				
	a. Blanks:				
	b. Bulks:				

Confined-Space Entry Permit

Date and time issued: 9/24 9 a.m. Date and time expires: 9/24 1 p.m.

Job site/space ID: Storage Tank #42 Job supervisor: Susan Air

Equipment to be worked on: Stir paddle Work to be performed: Replace blade

Stand-by personnel: Team On-It

1. Atmospheric checks:

Time 6:48

Oxygen 19 %

Explosive 21 % LFL

Toxic 400 PPM H_2S

2. Tester's signature: Sam Sampler

3. Source isolation (no entry):

Pumps or lines blinded, disconnected, or blocked N/A Yes No

4. Ventilation modification:

Mechanical..... N/A Yes No

Natural ventilation only..... N/A Yes No

5. Atmospheric check after isolation and ventilation:

Oxygen 19.5 % > 19.5 %

Explosive 1 % LFL < 10 %

Toxic 1 PPM < 10 PPM H_2S

Time 7:30 a.m.

Tester's signature: Sam Sampler

6. Communication procedures: line of sight, hand signals

7. Rescue procedures: harness/tripod

Confined-Space Entry Permit, cont.

8. Entry, standby, and back up persons:

Successfully completed required training?..... Yes No

Is it current?..... Yes No

9. Equipment:

Direct reading gas monitor tested..... N/A Yes No

Safety harnesses and lifelines for entry and standby persons..... N/A Yes No

Hoisting equipment N/A Yes No

Powered communications..... N/A Yes No

SCBAs for entry and standby persons..... N/A Yes No

Protective clothing..... N/A Yes No

All electric equipment listed Class I, Division I,

Group D, and non-sparking tools..... N/A Yes No

10. Periodic atmospheric tests:

Oxygen 19.5 % Time 7:50 a.m. Oxygen 19.5 % Time 8:20

Oxygen 19.5 % Time 8:40 a. Oxygen _____ % Time _____

Explosive <1 % Time 7:50 Explosive <1 % Time 8:20

Explosive <1 % Time 8:40 Explosive _____ % Time _____

Toxic 1 % ppm Time 7:51 Toxic 2 % ppm Time 8:21

Toxic 1 % ppm Time 8:41 Toxic _____ % Time _____

We have reviewed the work authorized by this permit and the information contained herein. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit prepared by: (Supervisor) Susan Air

Approved by: (Unit Supervisor) In charge Person

Reviewed by: (CS Operations Personnel) TeamOn-It lead

This permit to be kept at job site. Return job site copy to Safety Officer following job completion.
Copies: White Original (Safety Office), Yellow (Unit Supervisor), Hard (Job site)

Health and Safety Officer Report

Ok Fred 7/17 11a.m.

Unintentional release

Date: July 17 2014 Location: Loading Dock
Hazardous Material: Drum pallet dropped 7:15a.m.
Paint drums

Direct reading gas monitor tested..... N/A Yes No 7:20a.m.

Pre-response monitoring: Time: 7:30a.m.

Oxygen 20.1 %
Explosive <1 %
Toxic 10 % as Hexane

Response initiated 7: Time: 7:45

Periodic Monitoring

Time <u>7:50a.m.</u>	Time <u>8:30a.m.</u>	Time <u>9:25a.m.</u>
Oxygen <u>20.1</u> %	Oxygen <u>20.1</u> %	Oxygen <u>20.1</u> %
Explosive <u><1</u> %	Explosive <u><1</u> %	Explosive <u><1</u> %
Toxic <u>15</u> %	Toxic <u>5</u> %	Toxic <u>0</u> %

Response Terminated Time: 9:30 cleanup 10:30 decon

Direct reading gas monitor rechecked..... N/A Yes No