



Develop an Exercise Developer Guide

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Midwest Consortium for Hazardous Waste Worker Training

Acknowledgments

The Midwest Consortium developed this template for Program Directors and facilitators who want to develop an exercise that can be added to the MWC programming. The development and training are conducted under cooperative agreement number U45 ES 06184 from the National Institute of Environmental Health Sciences.

We encourage you to comment on these materials. Please give any comments to your Program Director.

Warning

This is not a 'use now for training' facilitator guide; rather the next pages include the approach to developing an exercise. When complete, it may be used, then revised and the Program Director at your training center will send it to the MWC, so that others may use it. In this way, we will increase the training materials available across the Midwest Consortium centers.

This guide was updated 6/20/2024.

Contents

Overall Guidance

Bloom's Taxonomy for writing learning objectives

Supporting Documents Guidance

Exposure Scenario Development Worksheet

Worksheet Examples

Participant Guide Template

Facilitator Guide Template

Develop an Exercise

Materials

- Incident Command System Communication Exercise and other MWC exercises as examples (see <https://mwc.umn.edu>)
- Bloom’s Taxonomy (for writing learning objectives)
- Guidance for Supporting Documents
- Exposure Scenario Development Worksheet
- Examples of worksheets used in MWC exercises
- Template for Participant Guide
- Template for Facilitator Guide

Approach

Select

- Conduct reconnaissance:
What hazards are of interest to this group?
How can avoidance/minimization of these hazards be addressed with an exercise?
Obtain any needed supporting written plans for the group (contract program only)
- Review current MWC exercises
 - If there is an existing exercise—use it
 - If there is an existing exercise that could be ‘tweaked’, discuss with Program Director

If there is no existing exercise, discuss with peers and Program Director and follow this guidance to develop a new exercise to share with the Consortium training centers.

Develop

1. Review existing facilitator-initiated exercises for format and content/guidance
2. Develop learning objectives to achieve the outcome(s) identified (see Bloom's taxonomy)
3. Develop the needed scenario/event/situation description (see Exposure Scenario Development Worksheet below)
4. Develop supporting documents (see below)
5. Develop Worksheet(s) (see Examples of Worksheets below)

A good Worksheet is a listing of relevant information – it is always more useful at the end of the exercise to have information written down, and that requires space to write it!

6. Complete the Participant Guide using the Participant Template provided
7. Complete the Facilitator Guide using the Facilitator Template provided
8. Pilot with one or more persons not involved in development
9. Revise
10. Use in training
11. Revise based on comments--pros/cons/issues

Share

Forward to Midwest Consortium for use by others

Bloom's Taxonomy for writing Learning Objectives

- **Knowledge** (recall of specific information)
Key words: define, describe, identify, label, list, match, recognize, name
Measure:
Exam: multiple choice, matching, fill-in, other regurgitation method, or verbal exam
Example: know if a TLV is the enforceable exposure limit
- **Comprehension** (use information in a predictable way)
Key words: translate, convert, defend, distinguish, estimate, explain, give examples
Measure:
Exam: word problem with calculation or selection of alternatives, open-ended question, or verbal exam; with documentation sheet of objective criteria
Report: graded with specific criteria for evaluation
Example: distinguish between the three most-used exposure guidelines
- **Application** (use information in an abstract situation)
Key words: change, compute, demonstrate, discover, manipulate, predict, show
Measure:
Exam: word problem with calculation or selection of alternatives, open-ended question, or verbal exam; with documentation sheet of objective criteria
Report: graded with specific criteria for evaluation
Example: for a compliance inspection, select the exposure guideline to be used
- **Analysis** (organize information or situation into logical elements)
Key words: diagram, discriminate, illustrate, infer, relate, select
Measure:
Exam: word problem with calculation or selection of alternatives, open-ended question, or verbal exam; with documentation sheet of objective criteria
Report: graded with specific criteria for evaluation
Example: explain why TLV/PEL/REL values are different for a specific compound
- **Synthesis** (putting the parts together)
Key words: categorize, combine, compose, summarize
Measure:
Report: graded with specific criteria for evaluation
Exam: verbal exam, with documentation of objective criteria
Example: present reasons why TLV/PEL/REL might be used
- **Evaluation** (make judgments)
Key words: appraise, compare, conclude, explain, support, justify
Measure:
Report: graded with specific criteria for evaluation
Exam: verbal exam, with documentation of objective criteria
Example: justify selection of TLV/PEL/REL for an exposure situation

Supporting Documents Guidance

Depending on your learning objectives, one or more of the following may be needed:

Any program:

- A written description of the situation (exposure scenario) that includes relevant factors shown in the example in this section. This description should be very clearly written when provided to the participants—bullets may be a useful format to make it easier to read.
- Triggers to provide information as the scenario event changes (see Stimuli, in this example).
- Resource materials (print or electronic)
- Include citation(s) for relevant regulations or guidance
 - example, FEMA guidance on ICS Plans
 - 1910.120(q)(6)(iv)(F) Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available.

Contract program:

- Exposure scenarios relevant to the work force
- Employer plan(s)

Reminder: Medical clearance for training is required if Level A or B are used

Exposure Scenario Development Worksheet

Factor	Initial Condition	Stimulus #1	Stimulus #2
Weather conditions			
Topography			
Surrounding vegetation, Waterways, highways, drains			
Vulnerable populations in the area			
Time of event			
Mode(s) of Transportation Involved			
Exact location			
Hazardous material(s)			
Quantity released or release rate			
Quantity not initially released			
Fire?			
Incompatibles nearby			
PPE needed			
Air concentrations reported			

Examples of worksheets from MWC exercises

Worksheets should be developed to document active involvement of participants and to assist in assessing if the learning objectives were met.

When developing a worksheet, refer to the learning objectives and include each in the documentation. For example, if an objective is to ‘demonstrate use’, then a worksheet will include an assessment of the steps needed for proper use. If the learning objective is to identify whether a measured level is a hazard, the worksheet will include the measured concentration, the standard or guideline exposure level and a decision based on comparison of the two values, in order to document that the participant found the correct value and made the correct decision. These worksheets can be completed by an individual, or by a group as a small group activity.

On the next few pages are examples of a ‘use equipment’ exercise worksheet (from a Respiratory Protection exercise) and an ‘information gathering’ exercise worksheet (from the DOT-ERG exercise).

Other examples of worksheets are shown with MWC exercises in Training Manuals or single exercises at <https://mwc.umn.edu>.

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Name: _____

Respiratory Protection Lab 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: _____

ERG Worksheet

(Instructor will provide ID number, container type, and time of day for your use on this exercise.)

ID Number: _____

Container: Rail Tank Car Highway Tank Truck 150 lb. Cylinder Drum
Roll-Off Box

Time of Day: 2 a.m. 2 p.m. **Wind Speed (if applicable):** _____

Instructions: Using the information in the *Emergency Response Guide*, answer the following questions, providing all significant information.

1. The substance is (you need to give only one name): _____
2. a. The Guide number that should be consulted for more information is: _____
b. The Guide title is _____
3. The distance to allow for each of the following (feet or miles) is:
a. Isolation _____ b. Evacuation _____

[Use low end of range for small release, high end of range for larger release. If the distance cannot be determined or is not given in the Guide, put "N/A"]

4. The primary hazard is due to: a. Health b. Fire
5. Major fire or explosion hazards due to this type of material are (list up to three):

6. Potential health effects from exposure to this material are (list up to three):

7. What respiratory protection is recommended for responses to this material?

<insert name> Exercise

Overview

<insert sentence describing the learning need that was identified prior to developing this exercise>

This exercise was developed for use in <insert the types> training programs. <insert a sentence or two summarizing the knowledge or skills that will be increased using this exercise>

Objectives

When completed, you will be better able to:

- <objective 1>
- <objective 2>
- <objective 3>

Exercise: <insert name>

<insert text and any resources needed for participant to complete the exercise>

<insert exposure scenario>

Complete the Worksheet(s) provided and be prepared to share the decisions made in your group with the other participants.

<insert Worksheet(s)>

Closing

1. Review the Learning Objectives – Were they achieved?

2. Based on this Exercise, what takeaways do you have?

Please ask any remaining questions

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<insert name> Exercise

Time Requirement: <insert number> hours

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

Materials

- Participant Guide, worksheets, etc
- If using devices, one per participant or group as appropriate
- Whiteboard or equivalent; markers
- < Insert any other materials needed as a resource for the exercise >

Objectives

When completed, participants will be better able to:

- <objective 1>
- <objective 2>
- <objective 3>

Teaching Methods

- Presentation/discussion
- Small-group activity

Facilitator Preparation

- Review the Participant Guide
- Review integration of exercise into the overall program agenda
- Review exposure scenario and copy (if needed)
- Review Worksheet(s) and copy for each participant to record information
- Prepare answer key for Worksheet(s)
- Prepare all needed materials, including devices and internet connection if necessary
- <insert other items as necessary>

Minimum Content Requirements

- Review objectives
- Participate in exercise
- <insert other as appropriate, such as complete worksheet(s)>

Questions you May be Asked

Show several questions that might be asked and suggested answers or resources to find answers.

Presentation of the Session

This session can be presented as follows:

Review objectives

Exercise: <insert name>

Introduce the Exercise and describe the exposure scenario. Show relevant question(s) that will facilitate discussion.

Lead participants through Exercise per the Participant Guide; Distribute worksheets if used

Closing

1. Review the Objectives and ask – Were they achieved?
2. Ask: Based on this exercise, what takeaways do you have?

Answer any remaining questions.

Follow-up

Make this exercise better:

- Review and update the Participant and Facilitator Guides you developed from the Templates; your Program Director will send the final versions to MWC for others to use.
- Ensure that the NOTE regarding funding is shown in the Participant and Facilitator Guides.
- Organize the listing of 'takeaways' and forward to your program director. These are very important impacts to report to NIEHS.

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