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Refuge Chamber Expectations Training

Instructor Guide and Lesson Plans



Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health



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Overview

Refuge Chamber Expectations Training was created by a multidisciplinary team at the National Institute for Occupational Safety and Health (NIOSH) to inform miners of what to expect psychologically and physically if it became necessary to use a refuge chamber in a mine emergency. The presentation can be used either for one large group or for individual miners. The training is a multimedia Adobe Flash presentation containing pictures, audio, video, and interviews with miners who have used a refuge chamber in an emergency. It must be run on a computer with Adobe Flash Player installed (refer to the computer system requirements section).

Purpose

The purpose of this training presentation is to teach underground miners what to expect if they need to use a refuge chamber. Refuge chambers are a new technology that many miners find unfamiliar. Therefore, this training will expose miners to what it might be like psychologically and physically to be inside a refuge chamber over a period of time.

Target Audience

This material has been designed for underground miners at all skill levels. It can be integrated into required new miner training courses, annual refresher courses, or any other mine site training.

Requirements for Teaching This Module

- If this training is part of a Mine Safety and Health Administration (MSHA) required course, an approved instructor and/or content expert must deliver the training.
- Basic computer skills (keyboard, mouse, connect computer to LCD projector).
- If streaming this program from the internet, ability to download information from the internet is necessary.

Intended Use

The training is flexible in that it can be used for individuals or for a large group. In either case, it is recommended that discussion of the topic be included with the viewing of the multimedia presentation. Questions are provided to help prompt discussion. These discussion questions can be used to begin the class or after viewing the presentation.

In the case of group training, the trainer can stop to allow for discussion at any point before advancing to the next slide. For individual training, discussion should be led before or after all individuals have completed the training on their individual computers.

The instructor should have prior knowledge of refuge chambers and the specific type of refuge chamber at the individual mine. This will allow the instructor to give specific information about the refuge chamber's location, type, size, and interior. An instructor

manual and lesson plans are provided in this booklet. These should be used as guides for the trainer to use during the training session.

Computer System Requirements

The training session runs with Adobe Flash Player 10. The computer to be used in training must have the minimum specifications listed in the following tables.

HARDWARE

Windows®	Macintosh	Linux®
Intel® Pentium® II 450 MHz or faster processor (or equivalent)	PowerPC® G3 500 MHz or faster processor Intel Core™ Duo 1.33 GHz or faster processor	Modern processor (800 MHz or faster)
128MB of RAM	128MB of RAM	512MB of RAM 128MB of graphics memory

OPERATING SYSTEMS AND BROWSERS

Windows®

Platform	Browser
Microsoft® Windows Vista®	Microsoft Internet Explorer 7, Firefox 2.x, Firefox 3.x, AOL 9, Safari 3.x
Microsoft Windows XP	Microsoft Internet Explorer 6.0 or later, Firefox 2.x, Firefox 3.x, AOL 9, Opera 9.5 or later, Safari 3.x
Microsoft Windows Server® 2003	Microsoft Internet Explorer 6.0 or later, Firefox 2.x, Firefox 3.x
Microsoft Windows Server 2008	Microsoft Internet Explorer 7, Firefox 3.x
Microsoft Windows 2000	Microsoft Internet Explorer 6.0, Firefox 2.x, Firefox 3.x, AOL 9, Opera 9.5

Macintosh

Platform	Browser
Mac OS X v10.4 or 10.5 (PowerPC)	Firefox 2.x, Firefox 3.x, AOL for Mac OS X, Opera 9.5, Safari 3.x.
Mac OS X v10.4.x or 10.5 (Intel)	Firefox 2.x, Firefox 3.x, Opera 9.5, Safari 3.x

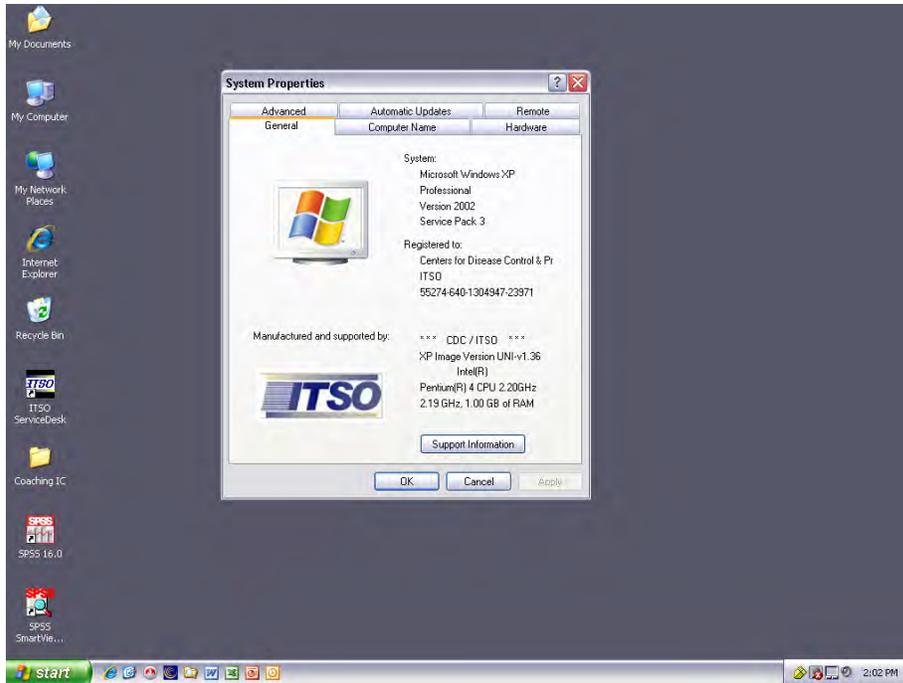
Linux®

Platform	Browser
Red Hat® Enterprise Linux (RHEL) 5	Firefox 2.x, Firefox 3.x, SeaMonkey 1.11
openSUSE® 11	Firefox 2.x, Firefox 3.x, SeaMonkey 1.11
Ubuntu 7.10 or later or 8.04 or later	Firefox 2.x, Firefox 3.x, SeaMonkey 1.11

Solaris™

Platform	Browser
Solaris 10	Firefox 1.5.x or later, Mozilla 1.7.x or later

To check the computer to be used in training for the above specifications, right click on the **My Computer** icon on the desktop. A menu will appear; left click on **Properties**. A System Properties dialog box will pop up with all of the above information displayed under the **General** tab. A sample dialog box is displayed below.



In addition to the above system requirements, the computer to be used in training must have the Adobe Flash Player 10 program installed. If the program is not installed on the computer, it can be found and installed for free at <http://get.adobe.com/flashplayer/?promoid=BUIGP>

If a problem occurs while attempting to run the training program, please review the above requirements.

Instructor Guide

Refuge Chamber Expectations Training

Background Information

Refuge chambers are portable chambers that are either made of steel or that inflate from a steel skid. They provide water, food, toilet, breathable air, and a seal from the outside environment.

Although different states and different mines refer to underground refuges by different names, this guide will refer to those nearest to the face as refuge chambers, whether inflatable from a skid or constructed from steel. Other popular terms for refuge chambers are rescue shelters and refuge shelters. Refuges that are toward the mine entrance or shaft, whether a pre-fabricated refuge chamber or one built into a crosscut, will be referred to as outby refuges because of their location in the mine. Outby refuges can be permanent, semipermanent, or portable and are usually located at every other self-contained self-rescuer (SCSR) cache. Outby refuges are sometimes called hardened rooms, outby shelters, and in-place shelters.

This training is intended for refuge chambers that are placed near the face. It may, however, be useful for other types of underground refuges.

Room Setup and Equipment

⇒ Arrange seating so that everyone has a clear view of the screen.

⇒ Equipment required for large group training:

- One computer
- LCD projector with audio capabilities
- Large screen
- Refuge Chamber Expectations Training computer package (included)
- Adobe Flash Player 10 installed on computer (comes pre-installed on most newer computers; can also be downloaded online for free)

⇒ Equipment required for individual training:

- One computer per trainee or one computer for a small group of trainees
- Refuge Chamber Expectations Training computer package installed on each computer
- Adobe Flash Player 10 installed on each computer (comes pre-installed on most newer computers; can also be downloaded online for free)
- Headphones for each computer

⇒ Training Evaluation Forms (included)

Advance Preparation

- The trainer should be thoroughly familiar with the operation and use of the specific refuge chamber used in the mine where training is taking place. Read the information provided by the refuge chamber manufacturer/supplier about the specific refuge chamber(s) ordered for the mine.
- Double check all equipment before the training. Have the Flash presentation open and ready to start.
- The trainer should evaluate the particular refuge chamber at the mine where training is conducted. Some refuge chambers can be used as way stations and others cannot without compromising the chamber. Refuge chambers used as way stations can provide a place to rest, to change SCSRs, to care for any injuries, etc. It is important to remember to consult with the refuge chamber manufacturer and the mine management for specifics about using the refuge chamber as a way station.

Anticipating Miner Reactions

Some of the miners in your training class may be resistant to entering a refuge chamber under any circumstances. Although it may not be possible to change their opinions, it is important to be able to respond appropriately to their comments in the context of the training. Some of these comments might include the following:

- “I would rather risk my life escaping than get trapped in one of those chambers.”
- “I’m not going to just sit around and wait for someone to rescue me. I’m going to get out.”
- “I just don’t trust that those chambers are going to keep us safe.”

It is extremely important to stress that escaping is always a miner’s first option in an emergency. All attempts at escaping should be exhausted before miners consider entering a refuge chamber or barricading. However, if it is impossible to escape the mine, or if a miner is seriously injured, it may be safer to enter a refuge chamber and wait for rescue teams to arrive.

Responses to the possible comments listed above could include the following:

- “Remember, in the event of an emergency miners should always try to escape first. Refuge chambers are only there if escape is not an option.”
- “If it is impossible to escape the mine, it is safer to enter a refuge chamber and wait for a rescue team to arrive.”

- “Refuge chambers have enough supplies for miners to stay in them for a number of days, providing time for a rescue team to arrive.” (Include specifics of the refuge chamber to be used at the trainees’ mine, such as how many miners it can hold and for how long, as well as what supplies will be provided in the refuge chamber.)
- “It is not worth risking your life or the lives of your crew members when the option of a refuge chamber is available.”
- “Refuge chambers are designed for the sole purpose of keeping miners safe in the event of an emergency.” (Include specifics of the refuge chamber to be used at the trainees’ mine to illustrate how it will keep them safe, such as the amount of pressure the walls can withstand, how the chamber will work in the case of a fire or flood, etc.)
- “In the event of a serious injury where escape is not an option, a refuge chamber can be life-saving.”

The responses listed above should be used as a guide if these types of comments are brought up during the training session. Responses should be adapted to the specific situation and to the miners involved in the training.

Lesson Plan for Group Training

<i>Activities</i>	<i>Content</i>
Discussion Starter	<p><i>What should you do in case of an emergency (e.g., mine fire, explosion, inundation)?</i></p> <p>Answer: Evaluate the situation and first try to escape.</p>
<p>The following discussion questions provide a lead-in to the presentation and establish the possibility that miners may need to use a refuge chamber at some point in an emergency.</p>	
Discussion Question	<p><i>If you cannot escape, what other options are there?</i></p> <p>Answer: Refuge chamber.</p> <p>Prompt: <i>What have other miners done in past emergencies?</i></p> <p>Answer: Quecreek miners went to the highest point in the mine and barricaded.</p> <p>Optional Follow-up: <i>What actions do you think might work the best to survive an emergency where miners cannot escape the mine?</i></p> <p>Answer: Always try to escape, but if you can't a refuge chamber might be your best option.</p>
Discussion Question	<p><i>What items would you need if you had to spend four days in a refuge chamber?</i></p> <p>Answer: Water, breathable air, food, toilet, something to pass the time, first aid/medicine. Communication, if possible.</p>
Introduce the Training	<p>Now we are going to view training on refuge chambers. This presentation will explain what it is like to be inside a refuge chamber.</p>
Flash Presentation	<p>Play the Flash presentation. Click at the end of each page to advance to the next page. Allow enough time for miners to see all the pictures before going on to the next slide.</p>

Note: Table continues on next page.

Lesson Plan for Group Training (cont.)

<i>Activities</i>	<i>Content</i>
These questions provide discussion of all of the elements in the presentation and potentially generate additional discussion.	
Discussion Question	<i>What parts of the presentation did you already know?</i> <i>What parts of the presentation didn't you know?</i> Prompt: <i>"Did you know how people may respond emotionally? For example, some may get quiet? What might you do to handle this?"</i> Prompt: <i>"Did you know how people may respond physically? For example, some may sweat or have body aches? What might you do to handle this?"</i>
Additional Discussion Questions	<i>What ideas or suggestions do you have for our mine to improve the use of refuge chambers?</i>

Lesson Plan for Individual Training

<i>Activities</i>	<i>Content</i>
Discussion Starter	<p><i>What should you do in case of an emergency (e.g., mine fire, explosion, inundation)?</i></p> <p>Answer: Evaluate the situation and first try to escape.</p>
<p>These warm-up questions establish that miners may need to use a refuge chamber at some point in an emergency. This provides a lead-in to the presentation.</p>	
Discussion Question	<p><i>If you cannot escape, what other options are there?</i></p> <p>Answer: Refuge chamber.</p> <p>Prompt: <i>What have other miners done in past emergencies?</i></p> <p>Answer: Quecreek miners went to the highest point in the mine and barricaded.</p> <p>Optional Follow-up: <i>What actions do you think might work the best to survive an emergency where miners cannot escape the mine?</i></p> <p>Answer: Always try to escape, but if you can't a refuge chamber might be your best option.</p>
Discussion Question	<p><i>What items would you need if you had to spend four days in a refuge chamber?</i></p> <p>Answer: Water, breathable air, food, toilet, something to pass the time, first aid/medicine. Communication, if possible.</p>
Introduce the Training	<p><i>Now you are each going to view training on refuge chambers. This presentation will explain what it is like to be inside a refuge chamber. You can complete this training on your own by advancing to the next slide when you are ready.</i></p>
Flash Presentation	<p>Walk around the room to make sure everyone is able to operate the Flash presentation.</p>

Note: Table continues on next page.

Lesson Plan for Individual Training (cont.)

<i>Activities</i>	<i>Content</i>
Discussion	<p>These questions provide discussion of all of the elements in the presentation and potentially generate additional discussion.</p> <p><i>What parts of the presentation did you already know?</i></p> <p><i>What parts of the presentation didn't you know before?</i></p> <p>Prompt: <i>“Did you know about how people may respond emotionally? For example, some may get quiet? What might you do to handle this?”</i></p> <p>Prompt: <i>Did you know how people may respond physically? For example, some may sweat or have body aches? What might you do to handle this?</i></p>
Additional Discussion Questions	<p><i>What ideas or suggestions do you have for our mine to improve the use of refuge chambers?</i></p>

Additional Topics for Discussion

Decision Making

This training is designed to be used in conjunction with other training about how to operate a refuge chamber and when to use a refuge chamber. NIOSH has also designed a paper and pencil simulation, “Harry’s Hard Choices: Mine Refuge Chamber Training,” which can be used as training in decision making. This training is available online at the following Web site: <http://www.cdc.gov/niosh/mining/products/product160.htm>.

The Disaster at Darby Mine

The disaster at Darby is profiled in the training. This may trigger discussion about what can be learned from this disaster and other past disasters. MSHA’s investigative report of the Darby Mine disaster can be found at www.msha.gov/FATALS/2006/Darby/darbyreport.asp

Training Evaluation

Age _____ Sex _____ Total years experience mining _____

Total years experience at this mine _____

Present job at this mine _____

Total years experience in your present job _____

Normal shift _____

Present location in the mine _____

Please circle the number which tells how much you agree or disagree with the following statements:

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Overall, this training was excellent.	1	2	3	4	5
Overall, this training was interesting.	1	2	3	4	5
Overall, this training was easy.	1	2	3	4	5
Overall, this training was informative.	1	2	3	4	5
Overall, this training was useless.	1	2	3	4	5
Overall, this training was important.	1	2	3	4	5

Please circle the number which tells how much you agree or disagree with the following statements:

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I feel better prepared if I ever find myself in a refuge chamber.	1	2	3	4	5
I am more aware of what it would be like in a refuge chamber.	1	2	3	4	5
I have a better idea of how someone might respond in a stressful situation, such as using a refuge chamber.	1	2	3	4	5
If someone had to spend time in a refuge chamber, they might feel nervous.	1	2	3	4	5
This training was relevant to my job.	1	2	3	4	5
I liked the format of this training.	1	2	3	4	5

The following questions ask about what you saw in the presentation. Answer either yes or no.

- | | YES | NO |
|--|--------------------------|--------------------------|
| 1. Will every miner react in the same way to being inside a refuge chamber? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. When confined to a refuge chamber, could a miner experience a variety of physical symptoms, such as dizziness or body aches? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Can paying attention to your breathing help to reduce any anxiety you may feel while in a refuge chamber? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. While in a refuge chamber, is it normal for a miner to experience negative side effects, such as confusion, due to the loss of sleep? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Do most miners panic in the event of an emergency? | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Is it normal for a miner to experience symptoms, such as nightmares and flashbacks, after surviving an emergency? | <input type="checkbox"/> | <input type="checkbox"/> |



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