PPE Refresher - Suit up and Decon

Time Requirement: 2-3 hours total (depending on task selected)

Number of Instructors: Minimum of 2, consistent with ratio in Minimum Criteria

Materials

- Participant materials (Participant Guide, worksheets)
- Whiteboard, easel and easel paper, or chalkboard
- Markers or chalk
- Clipboard and pen (one per trainee)
- Personal Protective Equipment (PPE) and supplies for Decon line
- Damaged/degraded PPE for the inspection activity prior to donning

Objectives

When completed, participants will be better able to:

- Demonstrate ability to inspect provided PPE
- Set up decontamination zones for a hazard
- Demonstrate ability to dressout in Level B or C
- Demonstrate ability to perform decon
Teaching Methods

- Presentation/discussion
- Demonstration
- Small-group activity
- Individual activity

Suggested Instructor Preparation

- Review Participant Guide and exercises
- Test all web links prior to the session and if any are inoperative please notify the Midwest Consortium at hilbertj@ucmail.uc.edu
- Review the Chemical Protective Clothing (CPC), Respirator, Work Practices and Decon sections of the program that these participants have completed
- Review 29CFR1910.120, with special attention to paragraph k for site workers, p(8)(i) for TSDF, and q for ER
- Obtain company-specific Standard Operating Procedures (SOPs) or use Standard Operating Guideline (SOGs) from the long programs already completed
- If possible, review company-specific SCBA and equipment
- Select an activity for the entry team. Through reconnaissance you may be able to identify a site-specific drill.
- Prepare copies of the worksheet
- Prepare an outline for notes to be included in the program file
- Ensure that you have assembled all the materials needed for each exercise
Minimum Content Requirements

- Review different types of chemical protective clothing (CPC) that are available
- Selection considerations
- Different levels of protection of PPE
- Characteristics and properties
- Precautions when wearing CPC
- Inspect provided PPE
- Don and doff Level B or C
- Set up decontamination zones for a hazard
- Perform decon

Questions You May Be Asked

1. Participants might remark, "We don't do the inspection this way at our site. So what are we supposed to do?" You should be prepared to facilitate a discussion about working through union or management representatives to facilitate review and possible changes in the facility Health and Safety Plan (HASP). Emphasize that HAZWOPER requires the development and implementation of written procedures. Alternative procedures may be effective. Stress that inspection should be performed.

2. Trainees may ask, "Am I dragging contaminants around the plant and into my car and home if I don't follow decon properly?" The answer is yes. Use this opportunity to reinforce the need for proper decon to protect family members and the community.

3. Be prepared to discuss the company Respiratory Protection Program. Some participants may not know it exists, or question if it is complete. For open enrollment, general approaches of working through union or company health and safety officers to obtain a copy should be discussed. For contract programs, learn specific contacts as part of reconnaissance.

4. Trainees may question whether various procedures are adequate ("I just keep the face piece in the bottom of my locker"). For contract programs, reconnaissance will provide you with information about the written procedures, but these may not be implemented.

5. "What do I do when my employer tells me there is no budget to get new suits, but I have lost weight and need a smaller size?" Be prepared to facilitate a discussion on strategies to improve the company program through discussions with employee or
management representatives. Emphasize that the law requires that employers provide protective gear. Perhaps the employer is waiting to order a smaller size when the current supply runs out?

6. "What about facial hair? My employer has a 'no beard' policy, and I don't like it."

Emphasize that facial hair prevents a good fit, resulting in exposure to toxic substances.

7. “What is the buddy system and how is it used in the decon process?” Explain that the buddy system is where you are paired with another worker and you help one another and watch for signs of exposure, lack of air, or other responses to hazards.

8. “What about medical clearance?” Facilitate a discussion of the stresses of wearing PPE. Medical clearance is needed for respirator use; employers may have additional requirements based on other PPE.

**Presentation of the Session**

This session can be presented as follows:

- Review objectives
- Review the figures in the Participant Guide

**Chemical-Protective Clothing**

Ask: Why is protective clothing necessary?

Ask: What are the types of protective clothing you have used at a work site?

Ask: What are situations in which protective clothing is required?

- List responses where the entire class can see them.

Ask: What considerations should be made when selecting protective clothing?

- List responses where the entire class can see them.

Refer to hazards that the group might be exposed to.
Types of Chemical-Protective Suits

- Emphasize that different types of CPC are needed to protect against different hazards.

- Stress that totally encapsulating chemical-protective (TEPC) suits are the only ones that can protect from vapor hazards.

- Also note that CPC can have an expiration date, because it can and does degrade even in storage.

Selection of PPE

Ask: What hazards are present at your current work site or at sites where you have worked in the past?

List responses where all participants can see them. Point out that different hazards will require different PPE.

Levels of PPE

Ask: What equipment, according to OSHA, makes up Level A protective clothing? and "What is required, and what is optional equipment?"

If available, have a second instructor demonstrate the equipment for Level A.

Ask: When is Level A equipment necessary?

Repeat these questions and demonstration for Levels B, C, and D protection.

Non-vapor-tight TECPs may be used for Level B protection.

List 5 precautions to consider when selecting CPC, as listed in Participant Guide.

Have trainees make a list of five precautions to consider. This task should take about 3 minutes. Ask for volunteers to state what they considered.

List trainee responses where everyone in the class can see them. Add additional responses to complete the list.
Characteristics and Properties of CPC

Discuss the terms Penetration, Degredation and Permeation shown in the Participant Guide by reviewing the figures.

Refer to the Participant Guide for a list of CPC materials and their advantages and disadvantages.

Precautions When Wearing CPC

Refer trainees to the Participant materials for a list of precautions in the use of CPC.

Ask: How can you minimize each of the following potential hazards?

- Hearing impairment
- Vision impairment
- Heat stress
- Slips, trips, and falls

Make list on writing surface viewable by all

Emphasize:

- Care taken when donning and doffing gloves to avoid rips and tears
- Avoid placing hands and knees on the ground to prevent permeation of chemicals and abrasion of suit material
- Use of the buddy system

Inspection, Maintenance, and Storage of CPC

Ask: Why is it important to inspect, maintain, and properly store CPC?

Demonstrate how to inspect CPC including examining suits for cuts, holes, rips and tears, abrasions, weakness in zippers, signs of malfunctioning, and discolorations and visible chemical contaminants.
Donning and Doffing a Level of Protection

Stress the following:

- PPE should be inspected every time it is donned and doffed
- All tape should include tabs for ease of removal
- Positive and negative pressure checks of respirators should be performed every time a respirator is donned

Decontamination - Introduction

Ask: Why is decon important? What should be considered?

Make a list of the trainee responses where everybody can see them. You can fill in items omitted and refer participants to the introductory material in the chapter.

Another useful introduction might include several pictures of a decon line.

A short (Running time: 1:18) video of a decon line in action can be found at: http://www.youtube.com/watch?v=-s1Aukkngw8. This video (which has no audio) could be watched critically, and criticized for deficiencies at the end of the chapter.

Pre-Planning for Decontamination

The Health and Safety Plan (HASP) needs to be kept up to date for the hazards currently present at the site.

Preventing Contamination

PPE is not foolproof. For best protection of your health, always avoid direct contact with contaminants as far as possible.

Emphasize that sound engineering controls can significantly reduce or eliminate vapor hazards.
Work Zones

Establishing work zones helps to control contamination and protect the health of workers, their families and the community.

Primary Activities in Each Work Zone

The decontamination process takes place in the Warm Zone.

Decontamination Procedures

Equipment must be properly decontaminated. Any liquids and disposables must also be disposed of properly.

Decontamination Line

Proper removal of PPE in the decontamination line will allow the employee to leave the site without bringing contamination along.

Ask: From your experience, what procedures have you used to accomplish each of these?

- Protecting Decon Line Workers
- Emergency Decon
- Deconning SCBA
- Preventing spread
- Disposal
- Precautions during decon

List responses on writing surface viewable by all. Fill in any gaps.

Exercise – Suit-up and Decontamination

During this exercise participants will have the opportunity to inspect and then don and doff PPE ensembles for a decon line work.

Checklists are appended to this Facilitator Guide.
Materials

Minimum PPE and devices:

- SCBAs or APRs assigned to trainees
- 24 Chemical-protective suits-assorted sizes and brands (one with a tear)
- 24 Pairs of long outer gloves (include some that will need to be replaced)
- 24 Pairs of inner gloves (include some that will need to be replaced)
- 24 Pairs steel-toe, chemical-resistant boots
- Duct tape
- Hard hats (optional)
- Disposable outer boots (optional)
- Two-way communication system (optional)
- Disposable suits (optional)
- Ear protection devices-muffs and plugs (optional)
- Ice vest/cooling system (optional)
- Lab Performance Checklists (one set per trainee)

Minimum Decon Line Equipment:

- (3) pools or tubs
- Plastic sheeting, 15' x 45' minimum, 4 mil thick or greater
- Assorted brushes, minimum of 3 long-handled
- (3) Garden hoses with water hook-up and backflow preventer or 3 garden sprayers
- (4) Stools or three-step ladders (If using Level A, provide enough for suiting up, doffing, and decon.)
- (3) Trash bins with liners
- Clipboard and pen (one per trainee)
- Lab Performance Checklists (one set per trainee)
- Clothing racks

NOTE: if you have GloGerm or Glitterbug and a UV light available, it can be used to determine the completeness of decon. See http://www.glogerm.com/. Use care to use the UV light only on the PPE to prevent any burns to participants or instructors.
Presentation

Set up the area with PPE. Equipment should be displayed so trainees have the opportunity to handle it. Be sure that each trainee has a buddy.

Set up three stations as follows and rotate the teams through the three stations:

- Inspect and Don PPE (15-25 minutes)
- Decon and Doff PPE (15-25 minutes)
- Set up and Assist with Decon (30-50 minutes)

Two options, depending on class size:

- Option A: Divide the class into three teams
- Option B: If the class is very large, create four teams

Option A: 3 Teams

Phase 1:
- Team 1 sets up and performs decon line
- Team 2 dons PPE, goes through decon line, and doffs PPE
- Team 3 assists Team 2 donning and observes decon line

Phase 2:
- Team 1 dons PPE, goes through decon line, and doffs PPE
- Team 2 assists Team 1 donning and observes decon line
- Team 3 sets up and performs decon line

Phase 3:
- Team 1 assists Team 3 donning and observes decon line
- Team 2 sets up and performs decon line
- Team 3 dons PPE, goes through decon line, and doffs PPE

Option B: 4 Teams

Phase 1:
- Team 1 (up to 8 trainees) begins donning
- Team 2 (up to 4-6 trainees) assists with donning
- Teams 3 and 4 (up to 4-6 trainees each) set up decon line

Phase 2:
- Team 1 passes through decon line
- Team 2 begins donning
• Team 3 assists with donning
• Team 4 performs decon line

Phase 3:
• Team 1 performs decon line
• Team 2 passes through decon line
• Team 3 begins donning
• Team 4 assists with donning

Phase 4:
• Team 1 assists with donning
• Team 2 performs decon line
• Team 3 passes through decon line
• Team 4 begins donning

Phase 5:
• Team 1 performs decon line
• Team 2 observes
• Team 3 assists with donning
• Team 4 passes through decon line

Donning PPE

• Demonstrate each piece of PPE, as needed
• Review CPC inspection procedures, as needed. Emphasize degradation and permeation concepts
• With one person, demonstrate proper donning procedures
• Refer to manufacturer instructions for donning the SCBA
  o Example of method to check SCBA for proper operation:
    ▪ Make sure both valves are closed
    ▪ Open bottle valve fully. (Bell on gauge will ring.)
    ▪ Turn the bottle valve back 1/4 or about one twist of the wrist
    ▪ Open the main-line valve, and check to see if the regulator pressure gauge matches what was showing on the bottle pressure gauge
Close the cylinder valve. Make sure that the air pressure does not drop by 100 psig in 30 seconds

Very slowly, purge air from the regulator outlet. The needle of the gauge will drop slowly. The low-air alarm rings when the gauge is between 600 and 500 psig.

Close the main-line valve by pressing in on the release pin, and turn clockwise (to the closed position)

Hand out copies of the Checklists. Have each trainee complete the checklists, give to you to sign, and turn in.

Level B
- Put on suit
- Tape sleeves and pant legs
- Put on SCBA
- Tape on hood/mask
- Proceed single-file through decon line
- Complete lab performance checklist

Level C
- Put on suit
- Tape sleeves and pant legs
- Put on APR
- Tape on hood, if necessary
- Proceed single-file through decon line
- Complete lab performance checklist
- Review inspection and maintenance of PPE

Set up Decon Line and Assist with Decon

Option A
Note: The decon line is set up and disassembled by each team
- Trainees set up decon line
- Critique the line and correct problems as necessary
- Trainees run decon line. (May have them wear splash suits to keep from getting wet.)
• Trainees complete performance checklists, which you will review and initial
• Decon line is disassembled

Option B
Note: The decon line is set up initially and remains intact throughout the entire exercise
• First groups (Teams 3 and 4) set up decon line
• Critique the line and correct problems as necessary
• Trainees run decon line. (May have them wear splash suits to keep from getting wet.)
• Trainees complete performance checklists, which you will review and initial
• Final group (Team 1) disassembles the line

Summary
Review the learning objectives

Ask: Based on this exercise, what takeaways do you have as you go back to work?
List them on writing surface viewable by all

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 - Suit-up and Decontamination Line

During this exercise, you will have an opportunity to:

1. Inspect PPE

2. Don and Doff Level B or Level C PPE

3. Participate in decon line activities

For this exercise you will be teamed up with a buddy. Be sure to go through all stations with your buddy.

The instructor at each station will describe the problem, provide additional materials, and answer questions. Complete the Lab Performance Checklists provided by your instructor for each station, then have the instructor review and sign them. They will be retained by the training center as part of your training records.
Name: _________________________________

Buddy’s Name: ___________________________

**PPE Performance Checklist - Inspecting PPE**

1. Were inspection procedures described for:
   a. Boots? □ Yes □ No
   b. Outer gloves? □ Yes □ No
   c. Hard hats? □ Yes □ No
   d. Suits? □ Yes □ No

2. Did you inspect the gloves? □ Yes □ No

3. Did you find defects in the gloves? □ Yes □ No
   If yes, describe the defects:
   ______________________________________

4. Did you inspect a suit prior to donning? □ Yes □ No

5. Did you find defects in the suit? □ Yes □ No
   If yes, describe the defects:
   ______________________________________

Date ______________ Instructor’s Signature: ______________________________
Decon 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. Face piece     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
Name: _________________________________

Buddy’s Name: ___________________________

**PPE Performance Checklist - Inspecting PPE**

1. Were inspection procedures described for:
   a. Boots? □ Yes □ No
   b. Outer gloves? □ Yes □ No
   c. Hard hats? □ Yes □ No
   d. Suits? □ Yes □ No

2. Did you inspect the gloves? □ Yes □ No

3. Did you find defects in the gloves? □ Yes □ No
   
   If yes, describe the defects:

   ______________________________________

4. Did you inspect a suit prior to donning? □ Yes □ No

5. Did you find defects in the suit? □ Yes □ No
   
   If yes, describe the defects:

   ______________________________________

Date ______________ Instructor’s Signature: _______________________________
Name_______________________________________
Buddy’s Name________________________________

Decon 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 clean the respirator? ……………………………………… Yes  No

8. How long did you stay in Level C? _____ minutes
Decon Performance Checklist - Decontamination 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 work 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 work team? □ Yes □ No
6. Did the work team follow the decon team’s instructions? □ Yes □ No
7. Were all work team members fully decontaminated? □ Yes □ No
8. Were waste water 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: ___________________________