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Headquarters US Air Force  
Washington, DC 20330-1030

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# AIR FORCE SPECIALTY CODE 4B071 BIOENVIRONMENTAL ENGINEERING

## Respiratory Protection



## QUALIFICATION TRAINING PACKAGE

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## STS Line Item 4.14.6: Approve RP equipment

### TRAINER GUIDANCE

<b>Proficiency Code:</b>	3c
<b>PC Definition:</b>	Can do all parts of the task. Needs only a spot check of completed work. Can identify why and when the task must be done and why each step is needed.
<b>Prerequisites:</b>	Successfully select RP equipment
<b>Training References:</b>	<ul style="list-style-type: none"> <li>• AFI 48-137, <i>Respiratory Protection Program</i>, 15 July 2014</li> <li>• 29 CFR 1910.134(d), <i>Respiratory Protection</i></li> </ul>
<b>Additional Supporting References:</b>	<ul style="list-style-type: none"> <li>• 29 CFR 1910.10XX series (substance specific)</li> <li>• NIOSH Pub No. 2005-100, <i>NIOSH Respirator Selection Process 2004</i></li> <li>• ANSI Z88.2-1992, <i>Respiratory Protection</i></li> </ul>
<b>CDC Reference:</b>	4B051
<b>Training Support Material:</b>	<ul style="list-style-type: none"> <li>• Training scenario</li> <li>• 29 CFR 1910.10XX (if applicable)</li> <li>• NIOSH Certified Equipment List</li> <li>• AF Form 2773</li> </ul>
<b>Specific Techniques:</b>	Conduct training and evaluation using a scenario or an actual industrial worksite.
<b>Criterion Objective:</b>	Given a chemical scenario or actual work center surveillance data, calculator, references, and a completed AF Form 2773, approve the selected respirator with NO trainer assistance.
<b>Notes:</b> <p>AFI 48-137 para 2.12.2.1 states respirators will be selected IAW 29 CFR 1910.134 (d) and the NIOSH Certified Equipment List, and the rationale for selection will be documented by process in the workplace-specific written plan and on the AF Form 2773, Respirator Selection Worksheet, and uploads to the Shop Detail page in DOEHRs-IH.</p> <p>The respirator must be appropriate for the contaminant's physical form and chemical properties and the conditions under which it will be used. A NIOSH-approved respirator is then selected for the “situation” after the physical characteristics and functional capabilities and limitations, and the assigned protection factor have been considered.</p> <p>See Notes section below for formula.</p>	

## TASK STEPS

1. Identify the contaminant(s) of concern.
2. Determine if there is an OSHA substance-specific standard or other Air Force-approved guidance for the contaminant(s).<sup>1</sup>
3. Assemble relevant information for each contaminant of concern and classify the contaminant(s) (*Complete Parts I and II of AF Form 2773*).<sup>2</sup>
4. Calculate a hazard ratio (HR) for each contaminant (see Notes for formula).<sup>3</sup>
5. Identify any special considerations (*Part III of AF Form 2773*).<sup>4</sup>
6. Select the respiratory protective device appropriate for the contaminant's physical form and chemical properties and the conditions under which it will be used using criterion in 29 CFR 1910.134 (d), the AF Form 2773, and professional judgment.
7. Complete Part IV of the AF Form 2773 (or OEHMIS) and file.
8. Utilize OEHMIS (DOEHRS or equivalent), as applicable.

### LOCAL REQUIREMENTS:

### NOTES:

1. OSHA substance-specific standards and or AF approved guidance such as USAFSAM technical guides or AF Medical Support Agency policy letters sometimes specify threat control measures or occupational and environmental exposure limits (OEEL). If any such guidance exists for a contaminant of concern, follow those guidelines and requirements.
2. The following information is needed to classify contaminant(s) of concern and complete selection process and Parts I and II of AF Form 2773:
  - Contaminant name
  - Physical form
  - OEEL
  - Lower explosive limit
  - IDLH
  - Carcinogen
  - Sensitizer
  - Possible skin absorption
  - Concentration
  - Hazard ratio
  - Target organs and organ systems
  - Warning properties
3. Select respirators with an assigned protection factor (APF) greater than the value of the hazard ratio, as listed in AFI 48-137, Attachment 2. Divide the time-weighted average (TWA) exposure concentration for the contaminant by the OEEL. If the exposure limit is an 8 hour limit the TWA used must be on 8 hour average. If the exposure limit is based on 10 hours, use a 10 hour TWA.
4. The following information is needed to complete selection process and Part III of AF Form 2773:
  - If two or more contaminants affect same target organ the compliance factor must be calculated.
  - Isocyanate containing compounds

- Oxygen content & distance to hazard
- Work rate
- Temperature extremes – AFI 48-137, Attachments 5 & 6
- Length of time respirator worn
- Communication devices – AFI 48-137, Attachment 4
- Vision
- Other personal protective equipment worn
- Respirator worn in confined space

**Formula:**

$$HR = \frac{TWA}{OEEL}$$

Where:

TWA = time-weighted average

OEEL = occupational exposure limit

- If the contaminant has a ceiling limit, divide the maximum exposure concentration for the contaminant by the ceiling limit
- If the contaminant has a short term exposure limit (STEL), divide the maximum 15 min TWA exposure concentration for the contaminant by the STEL

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**TRAINEE REVIEW QUESTIONS**

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**STS Line Item 4.14.6: Approve RP equipment**

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| 1. Why is it necessary to determine if there is an OSHA substance-specific standard for the contaminant of concern?                                    |
| 2. Why must you consider other exposure routes, such as absorption, when assembling relevant information for each contaminant of concern?              |
| 3. What type of respirator is recommended for use in a high temperature environment?   |
| 4. When selecting a respirator, should the assigned protection factor for the respirator be greater than or lesser than the value of the hazard ratio? |

## PERFORMANCE CHECKLIST

### STS Line Item 4.14.6: Approve RP equipment

<b>Proficiency Code:</b>	3c
<b>PC Definition:</b>	Can do all parts of the task. Needs only a spot check of completed work. Can identify why and when the task must be done and why each step is needed.

DID THE TRAINEE...	YES	NO
1. Identify the contaminant(s) of concern?		
2. Determine if there is an OSHA substance-specific standard or other Air Force-approved guidance for the contaminant(s) ( <i>Complete Parts I and II of AF Form 2773</i> )?		
3. Assemble relevant information for each contaminant of concern and classify the contaminant?		
4. Calculate a hazard ratio for each contaminant?		
5. Identify any special considerations ( <i>Part III of AF Form 2773</i> )?		
6. Select the appropriate respiratory protective device?		
7. Complete Part IV of the AF Form 2773 (or OHMIS equivalent)?		
8. Utilize OEHMIS (DOEHRS or equivalent), as applicable?		
<b>Did the trainee successfully complete the task?</b>		

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 TRAINEE NAME (PRINT)

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 TRAINER NAME (PRINT)

## ANSWERS

1. Why is it necessary to determine if there is an OSHA substance-specific standard for the contaminant of concern?

A: If a more stringent standard such as a substance-specific OSHA standard exists for the contaminants, follow those guidelines and requirements for respirator selection.

(Source: AFI 48-137, *Respiratory Protection Program*, July 2014, para 1.1.2)

2. Why must you consider other exposure routes, such as absorption, when assembling relevant information for each contaminant of concern?

A: Wearing the respirator could increase worker exposure by longer stay times in a hazardous environment such as exposures to external radiation.

(Source: 4B051 CDC)

3. What type of respirator is recommended for use in a high temperature environment?

A: Air-line respirator.

(Source: AFI 48-137, *Respiratory Protection Program*, July 2014, Attach 6, para A6.3)

4. When selecting a respirator, should the assigned protection factor for the respirator be greater than or lesser than the value of the hazard ratio?

A: Greater than the value of the hazard ratio.

(Source: 4B051 CDC)