

<b>JSC Safety and Health Requirements</b>	JPR No.	<b>1700.1L</b>
	Effective Date:	<b>12/20/2018</b>
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## Chapter 5.6 Personal Protective Equipment

### ***This could be you . . .***

***An employee accidentally cut into a chemical line and some of the chemical splashed on the particulate respirator he was wearing. He suffered throat irritation and coughing because the particulate respirator wasn't designed to protect against the chemical.***

***An employee who wasn't wearing a hard hat hit his head on a pipe and fell to the floor.***

#### **5.6.1 Applicability of this chapter**

You are required to follow this chapter if you use personal protective equipment (PPE) in your work.

#### **5.6.2 What this chapter covers**

This chapter covers the selection, use, and maintenance of PPE. You can find specific requirements for respirators, hearing conservation, and asbestos in Chapter 7.2, "Respiratory Protection," Chapter 7.1, "Hearing Conservation," and Part 12, "Asbestos Control Requirements."

#### **5.6.3 When you need PPE**

5.6.3.1 Use PPE when working in hazardous situations where the hierarchy of controls (see chapter 3.2), or other corrective actions do not reduce the hazard to an acceptable level. The Safety and Test Operations Division and Occupational Health, along with your supervisor, will determine the need for and selection of PPE based on the hazards in the work area. The process is as follows:

- a. Supervisors and contractor companies shall do a hazard assessment on an employees' need for PPE and verify the assessment in writing. Include this assessment in the facility's safety and health documentation.
- b. The written verification shall certify the assessment has been done and includes the following:
  - (1) Workplace location.
  - (2) The date of the hazard assessment (Job Hazard Analysis).
  - (3) The name and signature of the person who certifies the evaluation has been done.

#### **5.6.4 How to get PPE**

- a. Supervisors (for civil service employees) and companies (for contractor employees) are responsible for providing PPE. For transient employees or visitors, the host organization is responsible for providing PPE.
- b. Where allowed by contract, you may obtain rigid frame prescription safety glasses by submitting JSC Form 557. JSC doesn't pay for any eye exams and provides one pair of prescription safety glasses every two years unless there is a significant change to your prescription or the current pair has been lost or damaged.

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NOTE: See NPR 4100.1, "NASA Materials Inventory Management Manual," for requirements for stocking and issuing PPE.

## **5.6.5 How to select PPE**

5.6.5.1 Select PPE based on a hazard assessment (Job Hazard Analysis) from your supervisor or company. It will state what hazards are present in the work area or during the performance of a job and what PPE is required. PPE shall fit you properly. PPE selection factors include:

- a. Exposure potential to hazard, including frequency and length of contact.
- b. Potential effects of skin contact with the hazard.
- c. The body part that could be exposed such as hands, face, chest, arms, etc.
- d. The protection factor of the PPE.
- e. Other safety hazards present such as falling, slipping, falling objects, electrical shock, etc., and the hazards that may be induced by wearing the PPE.
- f. Limitations caused by the PPE, such as reduction in sight, hearing, or touch.
- g. Work area conditions, such as temperature, humidity, abrasion, and cutting or tearing potential.
- h. Characteristics and limitations of the PPE, such as resistance to degradation, size, comfort, and dexterity.
- i. Anticipated use (single use vs. routine use, duration of use).
- j. Regulatory requirements. Use only approved PPE.
- k. PPE service life and cost.
- l. Ensuring simultaneous wearing of two or more pieces of PPE does not reduce the effectiveness of other PPE. (Example: Eye protection with respirators, ear muffs with hard-hats).

NOTE: Help in selecting PPE is available from the Safety and Test Operations Division for potentially hazardous physical or mechanical hazards and from Occupational Health for potentially hazardous chemical and biological agents.

## **5.6.6 Precautions to take when working around physical hazards**

5.6.6.1 Employees working around physical hazards shall observe the following requirements :

- a. Wear flame-resistant clothing when operations involve the possibility of explosion or fire.
- b. Wear arc-rated apparel in the presence of electrical arc hazards.
- c. Wear protective gloves made of cut resistant material when operations include handling sharp-edged or abrasive objects.
- d. Wear gloves made of thermal protective material when handling hot or cryogenic substances.

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- e. Wear gloves made of rubber conforming to the OSHA standard for dielectric strength when operations include potential exposure to electrical hazards.
- f. Use electrical protective equipment meeting 29 CFR 1910.137.
- g. Use hand protection meeting 29 CFR 1910.138.
- h. Wear hearing protection in hazardous noise areas. See chapter 7.1, "Hearing Conservation" .
- i. Wear hard hats when there is a potential for injury to the head from falling objects. See paragraph 5.6.9 .
- j. Wear eye and face protection when there is a potential for injury from flying particles, chemicals, or laser radiation. See paragraph 5.6.10 .

### **5.6.7 Precautions to take when working around chemical and biological hazards**

5.6.7.1 Employees shall wear protective clothing when working with hazardous chemical and biological agents and when required by the EPA, CDC, or OSHA standards. Base the selection of protective clothing on the environment in which it will be used. The section of the Safety Data Sheet marked "Exposure Controls/Personal Protective Equipment" gives specific instructions on PPE for the material being used. Use the following key points when selecting protective clothing:

- a. All chemicals pass or permeate through protective barriers sooner or later, with or without any visible evidence or change in the protective materials.
- b. A material may protect against one chemical very well but perform poorly against another chemical. Each chemical and material combination shall be considered. No single protective material is an absolute barrier against all chemicals.
- c. Protective gloves and other chemical protective clothing may all look alike. Be sure to select the right clothing for the job.
- d. When a chemical is absorbed by protective clothing material, it will continue to pass through the material.
- e. Chapter 7.4 provides additional information on PPE and precautions to be used when handling biohazards.

### **5.6.8 Precautions to take when working where head protection is required**

5.6.8.1 Employees exposed to head hazards shall observe the following requirements:

- a. Wear a well-fitting hard hat meeting 29 CFR 1910.135, "Head Protection," and ANSI specifications in ANSI/ISEA Z89.1, "Industrial Head Protection."
- b. Sanitize the shell and replace or sterilize the cradle and sweatband before giving the hard hat to another worker.
- c. Replace the cradle and sweatband to maintain the effectiveness of the hard hat. Replace them on a regular schedule as recommended by the manufacturer.
- d. Clean the shells with a mild soap and water. Never use solvents or abrasives.
- e. Wear a Class G or Class E hard hat around electrical hazards.

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- f. Store hard hats away from ultraviolet rays.
- g. Don't drill holes in your hard hat to attach things unless the hard hat is designed to accommodate holes.
- h. Inspect the hard hat for damage or wear each time you plan to use it, including both the shell and the suspension.

### **5.6.9 Precautions to take when working where eye and face protection is required**

5.6.9.1 Employees working in eye hazard areas shall observe the following requirements:

- a. Follow 29 CFR 1910.133.
- b. Wear side shields on your safety glasses when there is a hazard from flying objects.
- c. Employees who wear corrective lenses, may use one of the following types of eye protection:
  - (1) Goggles worn over the corrective lenses or
  - (2) ANSI-approved safety eyewear.
- d. Observe the following policy for wearing contact lenses:
  - (1) Employees may wear contact lenses if allowed by a workplace or task eye injury hazard evaluation. Request this evaluation through your supervisor and it will be conducted by Occupational Health. Occupational Health will identify chemical exposures (as required by 29 CFR 1910.132) and appropriate eye and face protection for contact lens wearers.
  - (2) Follow current OSHA regulations on contact lens wear and eye and face protection.
  - (3) In the event of a chemical exposure, begin eye irrigation immediately and remove contact lenses as soon as practical.
  - (4) Remove contact lenses at the first sign of eye redness or irritation.
  - (5) You shall never wear contact lenses when exposed to hazardous heat, radiation, and high-dust or high-particulate environments. The [NIOSH Current Intelligence Bulletin 59](http://www.cdc.gov/niosh/docs/2005-139/pdfs/2005-139.pdf) (<http://www.cdc.gov/niosh/docs/2005-139/pdfs/2005-139.pdf>) provides recommendations about contact lens use in a chemical environment.
- e. Wear faceshields or goggles when handling corrosive liquids, such as acids and caustics. Make sure the goggles:
  - (1) Have soft, nonflammable eyecups
  - (2) Are flexible enough to fit your face readily
  - (3) Are made so no splashing liquid can get in your eyes through the ventilation openings
- f. Wear goggles when exposed to vapors or fumes that could cause injury or discomfort to your eyes. Make sure the goggles have eyecups that fit your face snugly and have no ventilation openings.
- g. Wear goggles, helmets, and shields with a filter lens that meeting ANSI/ISEA Z87.1, "Occupational and Educational Eye and Face Protection," when doing arc welding, oxy-acetylene welding, furnace work, or any operation where your eyes are exposed to glare.

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- h. Wear face masks and shields to protect your face from light impacts, sparks, or chemical splashes. Make sure the mask or shield has a nonflammable transparent visor free from scratches or other flaws.
- i. Always wear safety glasses or goggles under face shields. Face shields are designed to protect the face, not as primary protection for the eyes.
- j. Sanitize goggles and glasses before giving them to another worker. Replace any parts, such as elastic headbands, that can't be sterilized.
- k. When not in use, keep goggles, glasses, and face shields in containers to protect them from damage or scratches and from contamination by oil, grease, or other materials.

**5.6.10 Precautions to take when working where foot protection is required**

5.6.10.1 Employees working where foot protection is required shall observe the following requirements:

- a. Follow 29 CFR 1910.136.
- b. Wear safety shoes shoes with a protective toe cap meeting the requirements of ASTM F2412-11 and ASTM F2413-11 where your feet may be exposed to falling heavy materials, such as in a materials warehouse or machine shop.
- c. Wear footwear made of rubber, specially treated leather, wood, or other suitable corrosion-resisting materials when handling corrosive liquids such as acids and caustics.
- d. Wear snug footwear when handling molten metals or hot or corrosive liquids. Make sure the footwear has no laces that would allow liquids to reach your foot.
- e. Wear nonmetallic footwear when working with electricity.
- f. Wear high-top leather footwear when working with cryogenics.

**5.6.11 Precautions to take when working where fall protection is required**

Employees shall follow Chapter 8.8, "JSC's Fall Protection Program."

**5.6.12 Precautions to take where hearing protection is required**

Employees shall follow chapter 7.1, "Hearing Conservation."

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### 5.6.13 Using and maintaining PPE

5.6.13.1 Use the guidelines below to get the most from PPE:

- a. Inspect PPE before putting it on. Look for:
  - (1) Imperfect seams and poor closures.
  - (2) Non-uniform coatings and scratches.
  - (3) Pinholes, tears, and cracks.
  - (4) Stiffness and discoloration.
- b. Don't use PPE that fails inspection. Put it aside and notify your supervisor.
- c. Put your PPE on and inspect it to make sure it is properly fastened, you are wearing it correctly, and it fits snugly, but doesn't bind.
- d. Inspect your PPE every so often while you work and make sure it is still protecting you.
- e. Stop work if your PPE fails. Stop work if you get too hot when wearing your PPE.
- f. If required, clean and decontaminate your PPE before taking it off. Take off your PPE before leaving the work area.
- g. Take off your PPE and store or dispose of it properly.
- h. Store your PPE separately from your regular clothing.
- i. Some chemicals permeate protective clothing. Follow the manufacturer's recommendations for decontamination, storage and reuse.
- j. If you reuse damaged PPE, make sure it is fixed to manufacturer's specifications.
- k. Maintain your PPE according to the manufacturer's schedule or to your organization's schedule, whichever is stricter. Minimize field repairs.
- l. Account for PPE as described in NPR 4200.1, "NASA Equipment Management Procedural Requirements."

### 5.6.14 Training for PPE

See Chapter 4.3, "Personal Protective Equipment Training."

### 5.6.15 Responsibilities for PPE

- a. As a **supervisor**, you are responsible for:
  - (1) Surveying, identifying, and documenting all actual and potentially hazardous work areas, job operations, and working conditions where PPE is required.
  - (2) Obtaining the required PPE.
  - (3) Ensuring employees are trained in proper donning and doffing, use, care and limitations of the specific PPE required for their work assignment.
  - (4) Making sure your operating procedures reflect PPE requirements.

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(5) Making sure everyone uses the equipment as directed and maintains it in good condition, including visitors to your work area.

b. As a **procurement coordinator**, you are responsible for:

(1) Processing all requests for PPE.

(2) Verifying PPE approvals with Occupational Health for chemical and biological hazards and the Safety and Test Operations Division for physical and mechanical hazards.

c. **Occupational Health** and the **Safety and Test Operations Division** are responsible for:

(1) Helping supervisors to determine hazards and the need for PPE.

(2) Helping in selecting and approving PPE.

(3) Reviewing and monitoring JSC's respiratory protection program.

(4) Fit-testing, training, and consulting with on-site respirator users.

(5) Providing general training on PPE.