

<b>JSC Safety and Health Requirements</b>	JPR No.	<b>1700.1</b>
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## **CHAPTER 9.1 HAZARDOUS MATERIALS SAFETY AND HEALTH**

### **9.1.1. Applicability of this chapter**

You are required to follow this chapter if you purchase or handle hazardous materials or control areas where hazardous materials are used or stored at JSC or JSC field sites.

### **9.1.2. What this chapter covers**

This chapter covers the purchase, use, handling, transporting, and restrictions of hazardous materials. This chapter addresses current Hazard Communication requirements under the OSHA HazCom 2012 standard.

### **9.1.3. What are hazardous materials?**

9.1.3.1 A hazardous material is anything that can be a danger to people by contact, inhalation, or consumption, or adversely impact the environment. These materials may include:

- a. [Chemicals](#) as listed in various regulations at URL:  
<https://nasa.sharepoint.com/sites/jsc-oh/SitePages/haz-com.aspx>.
- b. Radioactive materials.
- c. Explosives or any pyrotechnics.
- d. Pesticides.
- e. Materials that may become regulated wastes when discarded (e.g. hazardous wastes, medical wastes, pharma wastes)

### **9.1.4. What to do when you need to use a hazardous material that is a risk to health, safety, or the environment**

9.1.4.1 Employees who use or store, or plan to use or store, hazardous materials shall:

- a. Complete a new or update an existing hazard analysis (see paragraph 9.1.6 below) for new materials or new uses of existing materials. Obtain a Safety Data Sheet (SDS) when planning to use a new material. Notify Occupational Health before using any hazardous materials for the first time or before using a hazardous material in a new or different way.
- b. Request SDSs from the manufacturer or supplier when ordering a hazardous material. If they did not provide the SDS for a hazardous material, contact them immediately for a copy. You may not use the material until you have an SDS annotated with a "JSC SDS Number" and have addressed the identified hazards. (See paragraphs 9.1.8 and 9.1.9 below.)
  - (1) Keep SDSs up to date by having procedures for filing revised or newly acquired SDSs from the JSC SDS repository or supplier.
  - (2) Provide new or revised SDSs to Occupational Health.
- c. Review proposed purchases against the list of restricted and prohibited materials before starting a purchase request or supply requisition.

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- d. Get a waiver (JF 594 or JF 1121) before purchasing any prohibited material or materials with a restricted use as described in paragraph 9.1.15 below.
- e. Contact the JSC Radiation Safety Officer before purchasing radioactive materials (see Chapter 7.3).
- f. Review hazardous waste disposal requirements of residual, used, or contaminated material as well as empty containers to determine the cost impacts, environmental impacts, or regulatory restrictions. Regulations may require substitution of certain materials. For example, stratospheric ozone-depleting chemicals should be phased out under the Clean Air Act of 1990. See Chapter 5.8, "Hazardous Operations: Safe Practices and Certification," for more information on permits. See Chapter 4.1, "Safety and Health Training," for more information on safety and health training.
- g. Try to find a less hazardous material that will do the job within your quality standards.
- h. Purchase the smallest quantity necessary to do the job.
- i. Develop and maintain a list of hazardous materials in the JSC Hazardous Material Inventory Database. See Chapter 9.2, "Hazard Communication."
- j. Make sure employees are properly trained in the use and hazards of these materials before using them. See Chapter 9.2, "Hazard Communication."
- k. Use proper work practices and handling procedures. Storage of hazardous chemicals shall comply with the requirement of NASA Interim Directive (NID) 8715.140, NASA Hazardous Chemical Storage Requirements and any follow-on policy once this directive becomes incorporated into existing NASA policy.
- l. Use proper waste-handling practices, such as labeling, segregating, and avoiding the mixing of different hazardous waste streams.
- m. Make sure all hazardous materials are used properly and necessary precautions are taken so no harm is done to humans or the environment.
- n. As a prime contractor, make sure subcontractors who use hazardous materials on site follow the requirements of this chapter.
- o. Make sure visiting scientists who use hazardous materials follow the requirements of this chapter.
- p. Follow 29 CFR 1910 Subpart H, "Hazardous Material" and NPR 1800.1

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### 9.1.5. Recycling

Recycling unused hazardous materials is another method of reducing cost and minimizing wastes while conserving natural resources. Before recycling hazardous materials, contact the Environmental Management Office to determine any applicable environmental requirements or restrictions. and ensure compliance with the JPR 8550.1, JSC Environmental Compliance Procedural Requirements.

### 9.1.6. Planning to handle hazardous materials

9.1.6.1 Employees planning to handle hazardous materials shall complete a hazard analysis for each process they control, or is in their area, that uses toxic, reactive, flammable, radioactive, or corrosive chemicals. The hazard analysis will help to establish precautionary measures and help to determine the need for an emergency action plan (EAP). Obtain and use the most current SDS when performing the hazard analyses. The hazard analysis shall:

- a. Contain a listing of chemicals used in the process.
- b. Be updated whenever quantities increase or processes change.
- c. Address the failure mode of the spontaneous release, such as a container failure without operations in progress.

**NOTE:** See Chapter 2.3, “Hazard Analysis,” and associated links for instructions on completing the hazard analysis. Follow Chapter 3.3, “Process Safety Management,” and 29 CFR 1910.119. process safety management of highly hazardous chemicals.

### 9.1.7. What to do with a completed hazard analysis

9.1.7.1 If the analysis shows hazards with an RAC of 1, 2, or 3 as described in Chapter 3.5, “Hazard Correction Tracking,” , the responsible organization shall:

- a. Prioritize control measures using this order: engineering controls, administrative controls, work practices and personal protective equipment (PPE).
- b. Send a list of the hazards to Occupational Health for review.
- c. Develop or modify the EAP to cover the needed actions to ensure employee safety during fires, hazardous material releases, or other emergencies that might occur in the area. The EAP shall follow the requirements in Chapter 3.8, “Emergency Preparedness.”.

### 9.1.8. Responsibility for SDSs at JSC

9.1.8.1 The following applies to SDSs:

- a. JSC organizations acquiring hazardous materials shall obtain a current Globally Harmonized System of Classification and Labeling of Chemicals (GHS) compliant SDS using the process in paragraph 9.1.9 below.
- b. Occupational Health keeps the central repository of SDSs for JSC and assists in obtaining, collecting, maintaining, and distributing SDSs. An on-line database of these SDSs is available on the Health Home page. Contact Occupational Health SDS Coordinator at x37512 for any questions about SDSs.

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- c. SDSs for materials no longer in your inventory should be removed from your area SDS book or online repository.

**9.1.9. Submitting an SDS**

9.1.9.1 To submit an SDS for inclusion into the NASA/JSC SDS Database:

- a. To avoid duplication, first check the NASA/JSC SDS database. Search for any SDSs that are not in your files. If the SDS is in the database and scanned into the system, print the SDS directly off the screen.
- b. If the SDS is in the database but is not scanned into the system, submit a completed JSC Form 277, "Request for Safety Data Sheets Processing" (Appendix D), to Occupational Health SDS Coordinator. The SDS Coordinator will contact you when the item has been scanned into the system.
- c. If the SDS is not in the database, request a copy of the SDS from the manufacturer or supplier of the product.
- d. Submit all new and updated SDSs, along with a completed JSC Form 277, to Occupational Health SDS Coordinator. This individual will assign a JSC SDS Number and will contact you when the item has been scanned into the system.

**9.1.10. Purchase requests for hazardous materials**

9.1.10.1 Both contractors and civil servants shall follow these requirements for purchasing hazardous materials:

- a. State, on the purchase request, "SDS REQUIRED. RECEIVING OFFICE: UPON RECEIPT OF SDS, FORWARD ONE COPY EACH TO CENTRAL SDS REPOSITORY AND TO USER."
- b. Notify Occupational Health (x36726 or Email [jsc-dl-occ-health@mail.nasa.gov](mailto:jsc-dl-occ-health@mail.nasa.gov)) and the Environmental Management Office before:
  - (1) Using any hazardous materials initially.
  - (2) Changing the usage of any hazardous material.

**9.1.11. The role of procurement in purchasing hazardous materials**

- a. The Procurement Support Group shall:
  - (1) Support procurement in identifying contract requirements for safety concerns under JPR 1281.6, "Procurement."
  - (2) Coordinate all procurements involving hazardous materials with Occupational Health to identify requirements the supplier must follow and document. Occupational Health requires an SDS to accompany the shipment.
- b. Procurements of any potentially hazardous material shall follow subpart 23.3 of the Federal Acquisition Regulations (FAR) and NASA FAR Supplement, NFS 1823.3, "Hazardous Material Identification and Material Safety Data."

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- c. All procurement offices shall ensure specific safety or health requirements are included in purchase orders and contracts. Specifically, safety or health requirements will indicate whether an SDS is necessary.

**9.1.12. Responsibilities of the receiving office**

9.1.12.1 All receiving offices shall:

- a. Ensure an SDS accompanies all hazardous materials when specified on the purchase order.
- b. Confirm each shipping container has a label identifying the contents given on the SDS, the manufacturer or distributor of the material, and the specific physical or health hazards cited in the SDS.
- c. Send all SDSs accompanying any shipments of materials to the Central SDS Repository (SD3229). Keep copies of the original SDS in the receiving office repository to be distributed later with the material.
- d. Ensure a copy of the SDS accompanies all hazardous materials in storage and distribution either on site or off site. SDSs shall be made available to receiving office employees on request.
- e. Ensure receiving office employees are trained in the measures to take in the event of a spill or leak of hazardous materials.
- f. Immediately impound the material and contact the responsible forwarding office for correction if the SDS is missing from the shipping documents. If an SDS is already on file, the receiving office may add this SDS to the shipping papers if the name and supplier of the material on the shipping container and the SDS are identical. The exception to this are generic materials such as hydrochloric acid or caustic soda.
- g. Reject and return any shipment or transfer of hazardous materials if the supplier or forwarding office fails to provide an SDS.

**9.1.13. Safely handling and storing hazardous materials**

9.1.13.1 Employees who have hazardous materials in their work areas shall:

- a. Review the hazardous materials in their work areas to:
  - (1) Reduce the quantity of the material.
  - (2) Reduce the chance of a fire, a spill, or an accidental release.
  - (3) Reduce hazardous waste.
- b. Take steps to eliminate or reduce the risks of hazardous materials. This includes substituting a less hazardous material, if possible, or writing work requests, as necessary, to install required engineering controls. Excessing or disposing of any hazardous materials not used within the past three years will also reduce the risks.
- c. Never retain peroxide-forming chemicals for more than one year after purchase.
- d. Keep the proper fire extinguishers in the area. Contact the Safety and Test Operations Division for more information.

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- e. Store hazardous materials in a manner consistent with manufacturer’s recommendations and the Chemical Segregation and Storage Guide found on the Health home page.
- f. Post appropriate warning signs within work areas, and make sure tanks and piping are labeled per ASME A13.1, “Scheme for the Identification of Piping Systems.”
- g. Label all containers of hazardous materials within the work area as described in 29 CFR 1910.1200, “Hazard Communication Standard” (see Chapter 9.2).
- h. Use proper waste-handling practices, including waste segregation and disposal, for all processes using hazardous materials, per the Waste Segregation and Storage Guide found in JPR 8550.1, “Environmental Compliance Procedural Requirements.”
- i. Have appropriate fire protection systems and fire extinguishers for the hazardous materials used.
- j. Assess the need for escape respirators in areas where hazardous materials are stored.
- k. Make sure chemical alarms and warning lights are operational as described in Chapter 6.11, “Local Hazard Chemical Alarms.”
- l. Assess the condition of hazardous materials in storage at least quarterly and remove those determined to be unsuitable.
- m. Never keep food and drink in any refrigerators or freezers where hazardous materials are stored.
- n. Follow the requirements in chapter 4 of NPR 1800.1 and NID 8715.140.

**9.1.14. Restricted and prohibited materials at JSC**

9.1.14.1 JSC has decided some products are too hazardous to handle and are prohibited for purchase, storage, or use. Other products are toxic or highly regulated and restrictions may apply. See the following URL for the [list of restricted and prohibited chemicals](https://nasa.sharepoint.com/sites/jsc-oh/Shared%20Documents/RestrictedandProhibitedMaterials.pdf) at URL: <https://nasa.sharepoint.com/sites/jsc-oh/Shared%20Documents/RestrictedandProhibitedMaterials.pdf>  
The following requirements apply:

- a. JM/Project Management Office shall maintain JSC SPECSINTACT to conform to the policy on restricted materials that may be used in construction, modification, or repair of facilities, specifically asbestos-containing materials (ACMs), PCBs, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons and mercury.
- b. Organizations responsible for maintaining facilities or equipment, shall specify “non-asbestos” products, undetectable concentrations of PCBs, “non-CFC”-containing equipment, or non-mercury equipment in designs or equipment specifications.

NOTE: JSC is continually evaluating the restricted and prohibited materials list. Before purchasing or using a material, check the most current list at the URL above.

**9.1.15. Waivers to use a restricted or prohibited material**

9.1.15.1 Employees may request a temporary waiver if the use of a specific restricted or prohibited material is required to achieve JSC’s mission. Request a waiver by submitting JSC Form 594, Request for Waiver to Use a Prohibited or Restricted Chemical. Requests are



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submitted electronically using the NASA Electronic Forms (NEF) system. NEF will route the waiver request to JE/Environmental Management Office and Occupational Health. The following requirements apply:

- a. The temporary waiver request shall include the following information:
  - (1) Name and phone number of requestee.
  - (2) Organization name and mail code if NASA (or onsite contractor).
  - (3) Contract name and number if contractor.
  - (4) Name and Chemical Abstract Service number of chemical.
  - (5) Location(s) of proposed use (building and room number).
  - (6) Description of proposed process using chemical.
  - (7) Estimated quantity of the chemical that you expect to store and use per year for each location.
  - (8) Justification for use of the restricted or prohibited chemical. If no alternative is available for the chemical, you shall provide documentation of your efforts to locate an alternative.
  - (9) If a specification, standard, or contract line item requires the use of this specific chemical, provide a reference to that requirement (contract name and number and contract line item or procedure name and number) and a copy of the requirement.
  - (10) A copy of the hazard analysis and trade studies (if applicable) for the proposed activity or process that will use the chemical. Include any assessments of alternative materials.
- b. Employees shall not use the restricted or prohibited chemical until the Environmental Management Office and Occupational Health have approved and signed the temporary waiver. If a new chemical is placed on the restricted and prohibited chemical list, the using organization has 6 months in which to re-evaluate the process and find an alternative or request a temporary waiver.
- c. Temporary waivers stay in effect for a designated time period of between 1 and 5 years, depending on the safety, health, and environmental characteristics of the chemical. Organizations shall apply for a new waiver and have it approved before the expiration date of an existing waiver to continue using the chemical.

### **9.1.16. Other material restrictions**

9.1.16.1 The following materials, in concentrations specified in the standards listed below, are subject to additional restrictions under 40 CFR 61, "National Emission Standards for Hazardous Air Pollutants" (NESHAP), or under OSHA substance-specific standards. These materials shall follow:

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a. NESHAP restrictions found in this table.

<b><i>For . . .</i></b>	<b><i>Follow this subpart of 40 CFR 61 . . .</i></b>
Asbestos	M
Beryllium	C
Mercury	E
Vinyl chloride	F
Radionuclides	I
Benzene	J, Y, BB, and FF

b. OSHA restrictions in 29 CFR 1910, "Occupational Safety and Health Standards, General Industry:"

<b><i>For . . .</i></b>	<b><i>Follow 29 CFR 1910 . . .</i></b>
Asbestos	1001
4-nitrobiphenyl	1003
Alpha-naphthylamine	1003
Methyl chloromethyl ether	1003
3,3-dichlorobenzidine and salts	1003
Bis-chloromethyl ether	1003
Beta-naphthylamine	1003
Benzedrine	1003
4-aminodiphenyl	1003
Ethyleneimine	1003
Beta-propiolactone	1003
2-acetylaminofluorene	1003
4-dimethylaminoazobenzene	1003
N-nitrosodimethylamine	1003
Vinyl chloride	1017
Inorganic arsenic	1018
Lead	1025
Cadmium	1027
Benzene	1028
1,2-dibromo-3-chloropropane	1044
Acrylonitrile	1045
Ethylene oxide	1047
Formaldehyde	1048
Methylenedianiline	1050
1,3 Butadiene	1051
Methylene Chloride	1052



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c. OSHA restrictions in 29 CFR 1926, "Occupational Safety and Health Standards, Construction Industry:"

<b>For . . .</b>	<b>Follow 29 CFR 1926 . . .</b>
Asbestos	1101
Cadmium	1127
Lead	62
Methylenedianiline	60

**9.1.17. Requesting transportation of hazardous materials**

9.1.17.1 Employees shall use the following procedure for requesting transportation of hazardous materials:

- a. Contact Transportation Work Control at x42409 as far in advance as possible. Transportation resources are limited, and different kinds of hazardous materials cannot be transported together. Schedule transportation of compressed gas cylinders in advance since they are transported on a cylinder truck.
- b. Identify the hazardous material, the amount, the weight, the type of container, and locations for transport. Have an SDS for the material available at the time of pickup.
- c. The dispatcher will prepare a work order and the pickup will be scheduled. Depending on workload and the availability of equipment, work stoppage and rush shipments may be accommodated.
- d. Handle gas cylinders as described in JPR 1710.13, "Design, Inspection, and Certification of Pressure Vessels and Pressurized Systems."

**9.1.18. Transporting hazardous materials**

9.1.18.1 Employees transporting hazardous materials shall follow these requirements:

- a. a. 49 CFR subch. C, as well as State and local laws and regulations.
- b. Never transport hazardous materials on site or on public roads in a privately-owned car, truck, or any other privately owned vehicle, or NASA administrative aircraft. You may be denied access to the site if you try to transport hazardous materials outside of the acceptable conditions specified below:
  - (1) Household concentrations on site in quantities of less than 5 gallons.
  - (2) Small quantities of chemicals for analytical purposes in a government or an official company vehicle. Never travel on public roads unless approved as described in (4) below.
  - (3) Small quantities of hazardous materials that are unopened and packaged in the original DOT-approved shipping containers and only in government or official company vehicles. Never travel on public roads unless approved as described in (4) below.
  - (4) Small quantities of approved hazardous materials in a government or an official company vehicle on public roads and meeting the requirements in ["JSC Hazardous Material Hand-Carry Provisions"](#) at URL:

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<https://nasa.sharepoint.com/sites/jsc-oh/Shared%20Documents/HAZMAT%20Hand%20Carry%20Process.docx>.

- (5) Craftspeople may transport hazardous materials specific to their craft and essential to their work in a government or official company vehicle designed for that task but never on public roads. Examples include welders who transport compressed gas cylinders, custodial workers who transport cleaning fluids, and pesticide applicators who transport pesticides to application sites.
- c. Route any hazardous materials leaving JSC, Ellington Field, or Sonny Carter Training Facility that will travel on public roads through the Transportation Branch for appropriate handling per 49 CFR, Subchapter C, "Hazardous Materials Regulations." This includes any materials transported between JSC ("inside the fence"), Sonny Carter Training Facility, and Ellington Field.
- d. The Center Operations support services contractor is the only organization authorized to transport hazardous waste.
- e. The JSC Radiation Safety Officer or his or her designee is the only person authorized to transport radioactive materials.
- f. The Energy Systems Test Branch of the Propulsion and Power Division shall be responsible for pickup, issuance, transportation, controlled storage and end of life management of all Explosives, Propellants and Pyrotechnics (EP&P) on-site at JSC per the requirements of JPD 4500.1, "Pyrotechnics-Logistics Management."

### **9.1.19. Reporting an accident while transporting hazardous materials**

9.1.19.1 In general, contracted commercial carriers are responsible by law for reporting all accidents involving transportation of hazardous materials. Employees who transport hazardous materials using JSC equipment and have an accident in the public domain shall report the accident by:

- a. Calling the DOT Accident Hotline (800-424-8802) if it involves any of the following:
  - (1) A fatality.
  - (2) A person requiring hospitalization as a result of injuries received.
  - (3) Estimated property damage exceeding \$50,000.
  - (4) Possible existence of radioactive contamination.
  - (5) A continuous danger existing at the site, such as a spill or leakage of hazardous material.
- b. Notifying the JSC Safety and Test Operations Division Emergency Hotline at x34900 and the JSC Transportation Branch at x32301. They will help you meet other requirements.

**NOTE:** At WSTF, notify the NASA Safety Officer (Safety and Mission Assurance Office) and the Chief, Engineering Office. The WSTF Safety Officer will notify the JSC Director, Safety and Mission Assurance.

- c. Follow Chapter 2.6, "Mishap and Incident Investigation," for further guidance on mishap reporting and investigation.

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9.1.19.2 The Director, Safety and Mission Assurance, shall notify the NASA Headquarters Safety and Risk Management Division of the accident and will make sure the DOT has been notified. This includes sending a written follow-up report to the Associate Director for Hazardous Materials Regulations, DOT, Washington, D.C. 20590, within 15 days as stated in 49 CFR 171.16, “Detailed Hazardous Materials Incident Reports.” It also includes sending copies to the NASA Safety Division, Office of the Chief Engineer, NASA Headquarters.

### **9.1.20. Reporting emergencies**

You shall report all emergencies at JSC and Ellington Field by calling your emergency number - x33333 or (281) 483-3333 for JSC, Sonny Carter Training Facility, and Ellington Field; 911 off site; and x5911 at WSTF.

### **9.1.21. Emergency response**

Spills or leaks of hazardous materials often will require containment and countermeasures under EPA and OSHA regulations. Usually when a hazardous material spills or leaks into the environment or becomes an immediate threat to the safety of personnel or facilities, an emergency exists and requires immediate response under established contingency plans. Handle all leaks and spills as described in JPR 8550.1, “JSC Environmental Compliance Procedural Requirements,” mishap reporting requirements in Chapter 2.6, and JSC’s emergency response plan. Occupational Health will acquire specific information on trade name products for purposes of emergency or first-aid treatment.

### **9.1.22. For more information on handling hazardous materials**

- a. 29 CFR 1910, “Occupational Safety and Health Standards, General Industry”
- b. 29 CFR 1926, “Occupational Safety and Health Standards, Construction Industry”
- c. Clean Air Act of 1990, 42 U.S.C. Section 7401, et seq.
- d. 49 CFR Parts 171–174, “Hazardous Materials Regulations” (DOT)
- e. Department of Transportation Emergency Response Guidebook (latest edition)
- f. 40 CFR 61, “National Emission Standards for Hazardous Air Pollutants” (EPA)
- g. 40 CFR Parts 240–281, “Solid and Hazardous Waste Regulations” (EPA)
- h. 40 CFR Parts 370–372, “Emergency Planning and Community Right-to-Know” (EPA)
- i. 40 CFR 355, “Emergency Planning and Notification”
- j. 40 CFR 302.4, “Designation of Hazardous Substances”z
- k. NPR 1800.1, “NASA Occupational Health Program Procedures”
- l. JPR 8550.1, “Environmental Compliance Procedural Requirements”
- m. National Fire Protection Association Class IA Flammable Liquids

### **9.1.23. Additional responsibilities for hazardous materials**

- a. As a supervisor you are responsible for:

Verify correct version before use at: [Center Directives Management System](#)  
JSC Form JF2420B (Revised January 15, 2020) (MS Word August 28, 2006)

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- (1) Ensuring that a quarterly hazardous material inventory is completed and providing inventory information to Occupational Health in the format specified. (See Chapter 9.2.)
  - (2) Providing PPE to control the hazards of the materials being handled. Occupational Health will help with selecting PPE.
  - (3) Following all requirements for restricted and prohibited materials.
  - (4) Developing and maintaining a hazard analysis for processes using hazardous materials, as described in Chapter 2.3, "Hazard Analysis."
  - (5) Ensuring hazardous materials under your control have adequate evacuation and response procedures for a release or spill. Coordinate emergency procedures with the facility manager to ensure a unified emergency action plan for the facility.
- b. As a facility manager, you are responsible for ensuring that emergency action procedures you develop for your facility consider inputs from any supervisors in your facility who control hazardous materials, which, if released, could result in evacuation of your facility.