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Chapter 9.2 Hazard Communication

This could be you . . .

A laboratory worker spilled an unknown chemical and the facility was evacuated, causing lost work time for several employees.

An employee was exposed to a hazardous material. The MSDS/SDS wasn't immediately available for hazard information, causing medical treatment to be delayed.

9.2.1 Applicability of this chapter

You are required to follow this chapter if you work at JSC or a JSC field site. You are required to follow this chapter if you store, use, or dispose of hazardous materials at JSC. If you work at WSTF, follow WSTF requirements that meet the intent of this chapter.

9.2.2 What this chapter covers

This chapter is JSC's written hazard communication program to meet OSHA 29 CFR 1910.1200, "Hazard Communication Standard." This standard requires JSC to inform workers of the hazards of the materials that they work with or that exist in their work areas. Under recent changes to OSHA 29 CFR 1910.1200, to meet compliance with United Nations (UN) Globally Harmonized System of Classification and Labeling of Chemicals (GHS), the term Material Safety Data Sheet (MSDS) will be changing to Safety Data Sheet (SDS) and labeling will follow GHS guidelines. Manufacturers have until May 30, 2015 to comply with 29 CFR 1910.1200 changes and GHS requirements.

9.2.3 How JSC uses supplier information to determine hazards

JSC rarely makes hazardous materials. The Center relies almost entirely on MSDSs/SDSs from manufacturers and suppliers and gives them a unique JSC MSDS/SDS number. JSC organizations complete hazard assessments as necessary to identify and control risks. Supervisors shall provide information on any new hazards to their employees through training, instructions, safety alerts, etc.

9.2.4 Assessing the hazards of hazardous materials

9.2.4.1 JSC determines hazards through hazard assessments using system safety techniques as described in Chapter 2.3, "Hazard Analysis." You shall follow these guidelines for hazard assessments for the purpose of this written program:

- a. Classify all hazards as physical or health hazards (see definition in the Glossary).
- b. Use, as baselines, any technical information from the supplier, including MSDSs/SDSs and any pertinent information from the sources in 29 CFR 1910.1200.
- c. If an MSDS/SDS does not exist, consider any scientifically valid study that supports its classification as hazardous or establishes materials as being nonhazardous.

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d. When hazardous materials are created at JSC, the responsible organization shall create the MSDSs/SDSs for the products per the guidelines of 29 CFR 1910.1200 (the current OSHA HazCom 2012 standard), Appendices A and B.

9.2.5 Reporting additional hazards you identify with hazardous materials

9.2.5.1 When you identify a hazard that isn't in the MSDS/SDS, you shall submit a report detailing the hazard in question, the source of the information, an analysis of potential impacts, and what you recommend to reduce risk. Also, include any specific information that may refute your hazard determination. When you have conflicting information, attempt to compare the technical merits. Your management may submit the report without a conclusion to the following organizations within 30 days of completing the hazard assessment:

- a. Occupational Health Branch
- b. Safety and Test Operations Division

9.2.6 Mixing hazardous materials

When you mix "as-received" hazardous materials with other materials for later use, you shall do a hazard assessment as described in paragraph 9.2.4 of this chapter to assess the possible hazards of the mixtures.

9.2.7 Assessing the hazards of a mixture

9.2.7.1 You may test the mixture as a whole to determine its hazardous characteristics. You shall base all hazard assessments on positive data that either establish or refute the mixture as hazardous. You shall follow these requirements:

- a. If you don't test the mixture as a whole, you shall:
 - (1) Assume that the mixture has the same health hazards as its hazardous components present in concentrations greater than 1.0% by weight or volume for non-carcinogens. If there is reason to suspect that an ingredient present at a concentration < 1% will affect classification of the mixture for acute toxicity, you shall consider that ingredient to be relevant.
 - (2) Assume that the mixture has the same health hazards as its hazardous components present in concentrations greater than 0.1% by weight or volume for known or suspected carcinogens. You shall still identify known reaction products that are not present in the original components. If there is reason to suspect that an ingredient present at a concentration < 0.1% will affect classification of the mixture for acute toxicity, you shall also consider that ingredient to be relevant.
 - (3) Use relevant and scientifically valid data in place of testing to support any assessment of the physical hazards of the mixture.
 - (4) Indicate, in the hazard assessment, the lack of this information.
- b. You shall document the results of the hazard assessment so you can later share it with all potential users. If you create the mixture, you are responsible for a complete and accurate hazard assessment.

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- c. The Occupational Health Branch, the JSC Environmental Office, and the Safety and Test Operations Division shall review and approve initial shipments and accompanying documentation of such hazardous materials.
- d. You shall provide the percentage of each component in the mixture and an MSDS/SDS for each component with each shipment.
- e. You shall assume that the mixture poses the same hazards as each component, regardless of any prior or existing hazard assessments or test results, if someone using the mixture could be exposed to concentrations of any hazardous component above the OSHA- or ACGIH-permissible exposure limits.

9.2.8 Investigating and studying material exposures

The Occupational Health Branch shall conduct investigations and studies of material exposures you need in your work area. This includes sampling the concentration in the atmosphere to determine employee exposure levels.

9.2.9 Why JSC needs a hazardous materials inventory

The JSC Hazardous Materials Inventory allows for periodic review of all hazardous materials on site. The JSC Hazardous Materials Inventory meets the similar requirements of both the Environmental Protection Agency Superfund Amendments and Reauthorization Act and the OSHA Hazard Communication Standard. The Occupational Health Branch maintains JSC’s inventory with inputs from the organizations. You may search for the hazardous materials inventory for your area at <http://sd.jsc.nasa.gov/omoh/scripts/OccupationalHealth/MSDS.aspx> .

9.2.10 How to use the hazardous materials inventory

9.2.10.1 This inventory reflects the hazardous materials in your work area. The following requirements apply:

- a. All employees in your work area shall have access to the inventory. You may use the inventory as a guide to ensure that all MSDSs/SDSs you need are available.
- b. You shall keep the hazardous materials inventory at specific worksites per directorate instructions or provide access to the on-line inventory.
- c. Someone in your area shall be responsible for updating the inventory whenever you get a new product, when you remove an old product, or when there is a significant change in the quantity of the product.
- d. You shall enter new materials into the on-line inventory when you first receive them.

9.2.11 Contents of a hazardous materials inventory

- a. Your inventory shall include, as a minimum, the identity of the materials, as written on the label; the JSC MSDS/SDS numbers; the location of the materials; the amount usually kept on hand; the largest amount ever present in the workplace; and the quantity used annually.
- b. You shall specify the locations in enough detail to allow someone to find the materials quickly.
- c. If you run out of materials meant for replenishment, they shall remain on the inventory.

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- d. If you don't anticipate replacing them, you shall remove the materials from the inventory during the first quarter after the annual update.
- e. The inventory shall include all hazardous materials under the control of your area.
- f. .Construction contractors working at JSC shall submit a hazardous materials inventory to the Occupational Health Branch at the time work begins. This inventory shall include the names of the materials, the amount of the materials usually kept on hand at JSC, and the annual usage of that material. The contractors shall update the inventory at the completion of the work or at least annually.

9.2.12 What you should do if you are responsible for entering your area's items into the inventory

9.2.12.1 Each area shall have someone responsible for evaluating the hazardous materials inventory for that location. If you are responsible for maintaining the hazardous materials inventory for your work area, you shall:

- a. Contact the Occupational Health Branch to get a user code and password for your inventory.
- b. Enter all items into the on-line inventory available on the Health home page.
- c. Continue to list on the inventory any materials you run out of but plan to replenish or continue to use. Delete items no longer in stock that you no longer plan to use during the first quarter after the annual update.
- d. If a material has not been used during the past year, you should consider excessing the item.
- e. Get JSC MSDS/SDS numbers for all items and record the numbers in your inventory.
- f. Review and correct the inventory at least yearly or whenever quantities or locations change significantly. Some products require quarterly updates.
- g. Compare incoming materials with the hazardous materials inventory to screen for new chemicals.

NOTE: You can find additional directions for updating the hazardous materials database in the HazMat Inventory Users' Guide located at:

<http://sd.jsc.nasa.gov/omoh/scripts/OccupationalHealth/MSDS.aspx>.

9.2.13 Access to the inventory

9.2.13.1 Each directorate shall ensure that:

- a. All directorate activities, facilities, and employees related to hazardous materials are completely addressed.
- b. All employees have access to the hazardous materials inventory, MSDSs/SDSs, and a copy of this chapter during their shift.
- c. Employees keep their area hazardous materials inventory up-to-date in the on-line master site inventory.

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9.2.14 Products that are exempt from this chapter

You shall be familiar with the products and materials listed in the table below.

<i>For . . .</i>	<i>Regulated by . . .</i>	<i>Covering . . .</i>
Hazardous Wastes	29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," through the Environmental Office	<ul style="list-style-type: none"> Using hazardous chemicals or mixtures to treat hazardous waste is within the extent of hazard communication. While hazardous waste is exempt from JSC's hazard communication program, hazardous waste workers shall have access to all the services and benefits of JSC's hazard communication program. Once you identify a material as a hazardous waste, the material is no longer under JSC's hazard communication program (see JPR 8550.1, "Environmental Compliance Procedural Requirements").
Consumer Products	Consumers Product Safety Act and the Federal Hazardous Substances Act	<ul style="list-style-type: none"> Substances that must be packaged and labeled for the consumer market and their use in the workplace. They shall be used in a manner similar to that of consumer use in the scope of this exemption. You shall show that your use is similar to consumer use, which is usually obvious. This exemption does not include paints or WD40. If you have any doubt, contact the Occupational Health Branch for help.
Foods, Drugs, Cosmetics	FDA	<ul style="list-style-type: none"> Foods, food additives, fragrances, flavors, color additives, drugs, cosmetics, and medical or veterinary devices in all respects. They are exempt from this program when they are meant for human consumption. This includes drugs that are in solid, final form for a patient to take, such as pills or tablets, or are in retail establishments and packaged for sale to consumers.
Beverage Alcohol	Federal Alcohol Administration Act	Distilled spirits, including beverage alcohol, wine, or malt beverage intended for nonindustrial use in all respects.
Tobacco Products	Federal Alcohol Administration Act	Tobacco products in all respects.
Radioactive or nuclear materials	Human Health and Performance Directorate	All radioactive or nuclear materials and their use (see JPR 1860.2, "Radiological Health Manual")

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<i>For . . .</i>	<i>Regulated by . . .</i>	<i>Covering . . .</i>
Pyrotechnic (explosive) materials and devices	Energy Systems Test Branch and the Aircraft Operations Division (Ellington Field)	Pyrotechnic materials and devices located at JSC and Ellington Field (see JPD 4500.1, "Pyrotechnics – Logistics Management")

9.2.15 Exemption of wood and wood products

Wood and wood products are exempt in full from this chapter.

9.2.16 Articles other than raw chemicals

9.2.16.1 You shall follow these steps to determine whether an article will be considered as a hazardous material:

- a. First determine whether the item meets the definition of an "article" under 29 CFR 1910.1200. If any item meets all of the criteria, it is an "article" and exempt from the requirements of the Hazard Communication Standard.
- b. Assess the hazard potential for items that fail to meet one or more of the criteria listed in the definition of an article.
- c. Consider the entire lifetime of the article, including initial fabrication, test, end use, maintenance, storage, demolition, and disposal. Review the results of these assessments at the appropriate review activities, such as design reviews or TRRs. You shall have Safety and Occupational Health concurrence on the results of these assessments.

NOTE: Examples of articles that clearly fall under JSC's hazard communication program are welding rods, metal stock, and many construction materials (other than untreated wood).

9.2.17 Labeling storage and transportation containers

- a. You need to label all storage containers, tanks, vessels, drums, etc., meant for holding any quantity of hazardous materials for any period of time. The label shall include the following:

- (1) The identity of the hazardous material, identical to the trade name on the MSDS/SDS.
- (2) Hazard warnings to include the GHS code word and GHS pictograms. See http://www.osha.gov/Publications/HazComm_QuickCard_Pictogram.html.

The Occupational Health Branch will provide guidance in the design and use of hazardous materials labels or other means to warn users of physical and health hazards.

- b. When you use containers for transporting hazardous materials to or from JSC, you need to identify the containers. The US Department of Transportation (DOT) requires placards on containers (for example, truck, train car, etc.) of hazardous goods meeting certain type and weight requirements that are transported within the U.S. or on U.S. waterways. The identification shall include the following:

- (1) The name of the authorizing official, the assigned office, or element

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(2) The address of the organization authorizing the shipment

- c. You shall only use shipping containers with DOT approval specific for the material to be shipped.
- d. While you are on site, you may not transport hazardous materials in your personal vehicle.
- e. You may not bring personal hazardous materials (i.e., gasoline, etc.) on site.

9.2.18 Transfer containers

You don't need to label the containers that you use to quickly transfer a material between containers. This exemption includes beakers, buckets, funnels, portable pumps, and similar equipment. If you do not use all of the material immediately, you must label the container with the identity of the material and hazard warnings to include the GHS code word and GHS pictograms.

9.2.19 Identifying pipeline, ducts, valves, etc.

9.2.19.1 You shall clearly identify:

- a. All pipes, ducts, valves, etc., that carry hazardous materials in any form or visibly connect to hazardous materials sources per Chapter 9.1, "Hazardous Material Safety and Health," of this Handbook.
- b. Pipes, ducts, etc., that connect to hazardous materials sources and don't carry the materials in a manner that is clearly visible to any observer.
- c. The contents of pipes, ducts, etc., if you can't see their contents because of obstructions, such as a wall or if they are underground.
- d. If the number or location of pipes, ducts, etc., in any area makes it difficult to identify each one, you may hang placards around the area or along its length. Placards may take the form of color coding, labels, or signs. You shall place placards according to their size, visibility, and the points of approach to the area.

9.2.20 Availability of MSDSs/SDSs

- a. You shall be able to readily access MSDSs/SDSs in your work area during your work shifts.
- b. Your supervisor shall maintain an up-to-date hardcopy file of MSDSs/SDSs for hazardous materials that you use in your operations in a readily accessible location.
- c. All MSDSs/SDSs in your work area shall have a JSC MSDS/SDS number. Replace any unnumbered MSDSs/SDSs with numbered copies from the Occupational Health Branch or write the MSDS/SDS number on the copy you have. MSDSs/SDSs are also accessible on line through the Health home page at <http://sd.jsc.nasa.gov/omoh/scripts/OccupationalHealth/MSDS.aspx>. See Chapter 9.1 of this Handbook for ordering MSDSs/SDSs for hazardous materials used in your work area.
- d. If the MSDS/SDS in your work area is newer than the one in the MSDS/SDS database, send a copy of the MSDS/SDS along with a JF277 to the Hazard Communication Department of the Occupational Health Branch at SD3229.

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- e. If the MSDS/SDS in the MSDS/SDS database is older than 3 years old, check with the manufacturer to determine if there is a more current MSDS/SDS.
- f. Materials currently in use should have an updated SDS in the database by May 2015.

9.2.21 Training for handling hazardous materials

9.2.21.1 Training and certification are the responsibility of line management and shall meet the following:

- a. Everyone who works at JSC shall take initial and annual basic Hazard Communication (HazCom) training.
- b. Individuals who work with hazardous materials or those who work in buildings that contain hazardous materials shall initially take classroom HazCom training. After taking an instructor-led class, you may take your annual training through the on-line HazCom training accessible on SATERN. Individual contractors may arrange to provide their own HazCom training as long as the training meets the requirements of 29 CFR 1910.1200 and this Handbook and has been approved by the Occupational Health Branch.
- c. If you work in an office environment in a building that does not contain hazardous materials, you may take both your initial and annual training via the SATERN computer-based training.
- d. If you handle or use hazardous materials, or work in an area with hazardous materials, you also need to get specific information and training on the hazardous materials in your work area. This shall be completed by your supervisor when you are first assigned, annually, and when new hazards or chemicals are introduced in your work area. Organizations may request substance-specific training from the Occupational Health Branch, x36726.
- e. Basic and specific HazCom training shall collectively explain:
 - (1) The requirements of 29 CFR 1910.1200.
 - (2) Operations in your work area where hazardous materials are present.
 - (3) The location and availability of the written HazCom program, where to find the HazMat Inventory for your area, and MSDSs/SDSs.
 - (4) Methods and observations to detect the presence or release of a hazardous material in the work area, such as visual appearance or odor.
 - (5) Physical and health hazards of the materials in the work area.
 - (6) Measures you can take to protect yourself from these hazards. This includes specific procedures that protect you from exposure to hazardous materials, such as work practices, emergency procedures, and personal protective equipment.
 - (7) Details of JSC's HazCom program, including an explanation of the labeling system, the MSDSs/SDSs, and how you can obtain and use the appropriate hazard information.

NOTE: HazCom training records are available through SATERN. Records on training completed before March 2007 are available from the Occupational Health Branch (SD33).

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9.2.22 Information on hazard communication

9.2.22.1 Your manager shall make the following information available to you on request:

- a. 29 CFR 1910.1200, “Hazard Communication Standard”
- b. A written copy of this chapter, “Hazard Communication”
- c. MSDSs/SDSs for hazardous materials in your work area
- d. The hazardous materials inventory for your work area as described in paragraphs 9.2.9 through 9.2.13 of this chapter

9.2.23 Employees, on-site contractors, and employee representatives can support this program

9.2.23.1 You can support JSC’s HazCom program by:

- a. Following the guidelines in Chapters 9.1 and 9.2 of this Handbook.
- b. Reporting all safety and health issues to your supervisor for resolution.
- c. Participating in the JSC Safety and Health Action Team (see Chapter 1.6, “Employee Involvement,” of this Handbook). Participation allows you to comment on policy, accompanying surveys, and inspections, developing necessary corrective actions, and verifying the completion of all corrective actions.

9.2.24 Responsibilities for hazard communication

- a. As a **line manager** at any level, you are responsible for identifying and acquiring all necessary resources to implement the HazCom program and oversee the program in your organization.
- b. As a **supervisor**, you are responsible for addressing any employee concerns or complaints and ensuring your employees:
 - (1) Complete the training required by 29 CFR 1910.1200 and JSC’s hazard communication program.
 - (2) Know the necessary safety information, including hazardous materials inventories and MSDSs/SDSs.
 - (3) Have reviewed applicable job hazard analyses, job safety analyses, and other safety and health hazard assessments and evaluations annually.
 - (4) Select, use, and care for protective clothing, equipment, and emergency facilities.
 - (5) Select and use monitoring equipment properly.
 - (6) Have access to a copy of this chapter and the MSDSs/SDSs.
 - (7) Tell Center Operations of any hazards that need to be corrected (existing or potential) to make sure handling or use of hazardous materials in JSC facilities is safe.
- c. The **Center Operations Directorate** is responsible for making sure facilities are designed and built to anticipate hazardous conditions from activities that use hazardous materials, as

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requested by line management, the Safety and Test Operations Division, or the Occupational Health Branch.

- d. The **Occupational Health Branch** is responsible for:
 - (1) Reviewing guidelines, evaluations, and recommendations for health protection measures to make sure that they meet health standards for control of, or exposure to, hazardous materials.
 - (2) Helping line organizations implement all the health aspects of the Hazard Communication Standard and JSC’s hazard communication program.
 - (3) Maintaining a central repository of MSDSs/SDSs and the hazardous materials inventory.
 - (4) Making HazCom training available to JSC employees, both contractor and civil service.
- e. The **Safety and Test Operations Division** is responsible for:
 - (1) Reviewing guidelines, evaluations, and recommendations for safety protection measures to make sure that they meet safety standards for control of, or exposure to, hazardous materials.
 - (2) Helping line organizations implement all the safety aspects of the HazCom standard and JSC’s hazard communication program.

9.2.25 Laboratory requirements

- a. All JSC laboratories, meeting the definition in 29 CFR 1910.1450, shall follow the requirements in this chapter and Chapter 6.8, “Laboratory Safety and Health,” of this Handbook.
- b. If you work in a laboratory, you are responsible for demonstrating an understanding of, and the ability to practice, good laboratory techniques, including procedures to decontaminate yourself and the facility in the event of a spill or escape.
- c. Facilities engaged in manufacturing-type operations or in large-scale, multi-personnel activities that require close coordination of efforts are responsible for following the general requirements of the program found elsewhere in this Handbook.

9.2.26 Security-sensitive materials

9.2.26.1 If you control any security-sensitive hazardous materials, contact the JSC Security Office for guidance. Also coordinate with the Occupational Health Branch and the Safety and Test Operations Division. You shall:

- a. Generate a memorandum of understanding (MOU) outlining how you follow the intent of JSC’s HazCom program. The Occupational Health Branch and the Safety and Test Operations Division shall review and concur on the MOU.
- b. Consult the Occupational Health Branch and the Safety and Test Operations Division to help you determine whether specific materials are security sensitive.
- c. Never include drugs or narcotics, controlled substances, nuclear or radioactive substances, or explosives on unclassified lists of hazardous material.
- d. Compile classified lists separately and lock them in files.

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- e. Restrict the distribution of copies of such lists to the following:
 - (1) Occupational Health Branch
 - (2) Safety and Test Operations Division
 - (3) Security Office
 - (4) Responsible division office
- f. Allow access to such lists by any other person only if authorized by the Occupational Health Officer, with the concurrence of the requester's division chief.

9.2.27 Contractors who use hazardous materials on site

9.2.27.1 If you, as a contractor, work with hazardous materials on site at JSC, you shall:

- a. Obtain the following information before you begin any work on site:
 - (1) A copy of this chapter
 - (2) Instructions on accessing JSC's site-wide hazardous materials inventory
 - (3) Instructions on accessing the NASA/JSC MSDS/SDS database for hazardous materials at JSC, Sonny Carter Training Facility, and Ellington Field
- b. Distribute this information to employees according to 29 CFR 1910.1200.
- c. Make sure your employees see the information in subparagraph a above.
- d. Follow the requirements of JSC's HazCom program by working with your NASA technical manager.
- e. Have access to any information and technical help you need from JSC safety and health personnel. If you do specific, short-term jobs on site, you will be given information for pre-start reviews of your safety and health programs and scheduled activities. JSC will support you on a case-by-case basis.
- f. Perform the same duties that distributors perform for manufacturers and customers if they distribute hazardous materials at JSC.
- g. State your contract safety and health plan and how you will review purchase requests, if you will purchase hazardous materials to be brought on site.
- h. Describe how you will implement HazCom in your safety and health plan. The Safety and Test Operations Division will formally request updates through procurement channels.
- i. Supply a list of all hazardous materials used at JSC to the Occupational Health Branch for review when your contract starts, and update and submit the list at least yearly. This list should contain the amount of each chemical/material on hand, the most that would be on hand at one time, and the annual usage of that material. You shall provide information in a way to support the Occupational Health Branch's computer database.
- j. Inform the Occupational Health Branch of any hazardous material you need to purchase and use in an on-site facility for the first time. You shall supply a copy of the current MSDSs/SDSs for all hazardous materials you bring on site at JSC.

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9.2.28 Using hazardous materials off site

If you, as a contractor, use hazardous materials off site, you shall follow all applicable statutes, codes, or regulations as required.

9.2.29 For more information on hazard communications

- a. *Department of Transportation Emergency Response Guidebook* (latest edition)
- b. NPR 8715.3, “NASA General Safety Program Requirements”
- c. 29 CFR 1910.1200, “Hazard Communication Standard”
- d. 29 CFR 1910.1450, “Occupational Exposure to Hazardous Chemicals in Laboratories”
- e. *The Occupational Environment: Its Evaluation, Control, and Management*; 3rd Edition, American Industrial Hygiene Association, 2011
- f. *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices (TLVs[®] and BEIs[®])*, American Conference of Governmental Industrial Hygienists, latest edition

9.2.30 Safety and health records for hazard communication

Center-level – The Occupational Health Branch shall keep the hazardous material inventory records.

NOTE: See Appendix F, Attachment 1.1A for details on records required by this Chapter.