

Hazardous Materials and Flammable/Combustible Liquids

MSC-PRAC-30473

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Effective Date: January 8, 2010

Topic: Safety and Health

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PURPOSE

This practice identifies a key aspect of the Safety and Health (S&H) program, and establishes requirements for the safe handling, use, and storage of hazardous materials and flammable or combustible liquids. Further, this practice describes labeling, receiving and distributing, chemical compatibility, usage, and spill protection.

SCOPE

This practice includes the following major sections:

- General Requirements
- Process
- Emergency Planning

The requirements of this practice are consistent with the requirements published in the Hanford Mission Support Contract (MSC) Safety and Health virtual manual.

APPLICATION

This practice applies to MSA construction personnel.

NOTE: *When working on the Hanford Site, environmental practices/procedures also may apply; contact the Construction Supervisor/Superintendent (CS/S) for applicable requirements, information, and details.*

GENERAL REQUIREMENTS

Records generated during the performance of this activity are to be included in the Construction Work Package and will be managed in accordance with [MSC-PRAC-30374](#), *Construction Work Package* and [MSC-PRAC-30376](#), *Construction Document Control*.

In preparation for the use of hazardous materials, existing engineered safety and health controls (such as fire protection, building ventilation and exhaust, structural separation) are used instead of administrative controls when possible.

When engineered and administrative controls are not feasible or sufficient, personal protective equipment appropriate for the respective hazard is readily available and utilized. This equipment may include (but is not limited to) respirators, hoods, goggles, gloves, acid suits, or any combination necessary for prudent protection. Refer to the material safety data sheets (MSDSs) for specific personal protective requirements. Get approval for all the PPE to be used from Safety and Health personnel.

Hazardous materials are labeled, contained, and separated according to safe storage requirements. Use of glass containers is discouraged.

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Before starting work, contractors shall complete Part A, and the "Planned Waste Generation/ Disposal Information" box, of the *Chemical Inventory Worksheet* (Site Form [A-6003-412](#)).

MSDSs of all chemicals listed on the form shall be submitted to Health and Safety who will submit them to Hanford MSDS data administrator to be entered into the MSDS data base.

MSDSs are accessible to employees. MSDSs are either kept at each workplace where the hazardous material is stored, or are retrievable easily and timely through an electronic database (only available to Hanford site workers).

Safety and Health reviews and approves requisitions for purchasing hazardous materials.

Hazardous materials are used at the work area in accordance with established procedures which include manufacturers' information (including the MSDSs).

Refer to practice [MSC-PRAC-30483](#), *Compressed Gas Operations* for requirements pertaining to compressed gases and cylinders.

The "No Smoking or Open Flames" postings are strictly enforced where flammable liquids are being transported, used, or stored.

Empty, flammable liquid containers are kept away from ignition sources.

Flammable and combustible liquids are not placed where they could obstruct corridors, aisles, or exits; these liquids are not stored in stairwells.

Contact the MSA environmental coordinator for product disposal information (subcontractors contact the assigned MSA Construction Supervisor/Superintendent).

PROCESS

Receiving, Distribution, and Storage

The life cycle of hazardous materials includes specification, procurement, receiving, distribution, storage, use, and disposal. Consider worker protection, pollution prevention, and waste minimization at all phases of the life cycle.

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When hazardous materials are received, handle and prepare for field distribution in accordance with applicable procedures and standards. Inspect hazardous materials before further transport to ensure proper packaging and labeling.

While hazardous materials are stored, place properly and segregate according to the hazard class of the materials.

Receive and store hazardous materials in approved open storage areas, approved facilities, or in approved cabinets.

Design flammable and combustible liquid storage areas to prevent the spread of fire to other areas and have adequate separation distance as noted in National Fire Protection Association (NFPA) 30.

Post flammable liquid storage areas, "Danger Flammable Liquids" and "No Smoking or Open Flames."

Limit flammable liquid storage cabinets to 3 cabinets in any 1 storage area.

Storage cabinets are Underwriter's Laboratory Listed or Factory Mutual approved (UL listed or FM approved). No more than 454 liters (120 gallons) are stored in the 3 cabinets, a combined volume. Of this, no more than 227 liters (60 gallons) are Class I or Class II liquid as defined by NFPA 30.

Store flammables and combustibles in flammable liquid storage cabinets in accordance with the combinations listed below.

Flammable Liquids Liters (Gallons)	Combustible Liquids Liters (Gallons)	Total Storage Capacity Liters (Gallons)
227 (60)	227 (60)	454 (120)
189 (50)	265 (70)	454 (120)
151 (40)	303 (80)	454 (120)
114 (30)	340 (90)	454 (120)
76 (20)	378 (100)	454 (120)
38 (10)	416 (110)	454 (120)
0	454 (120)	454 (120)

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Maximum container sizes for storing flammable and combustible liquids are listed below. Initially store flammable and combustible liquids in the original manufacturer's container unless they are stored in listed or approved containers provided with Site labels.

Container Type	Flammable Liquids			Combustible Liquids	
	Class IA	Class IB	Class IC	Class II	Class III
Glass	0.5 L (1 pt)	1 L (1 qt)	4 L (1 gal)	4 L (1 gal)	19 L (5 gal)
Metal (other than DOT Drums or Plastic)	4 L (1 gal)	19 L (5 gal)	19 L (5 gal)	19 L (5 gal)	19 L (5 gal)
Safety Cans	7.5 L (2 gal)	19 L (5 gal)	19 L (5 gal)	19 L (5 gal)	19 L (5 gal)
Metal Drum (DOT Spec)	227 L (60 gal)	227 L (60 gal)	227 L (60 gal)	227 L (60 gal)	227 L (60 gal)

Rotate new hazardous material shipments with existing stock, so that the oldest stock is available first. (Label products with a limited shelf life with the date they were received.)

Chemical groups are separated into the following groups. Each group is stored separately from other groups in buildings or cabinets:

- Flammable and combustible chemicals
- Reactive chemicals
- Acids
- Alkalis

NOTE: *The MSA fire protection engineer is contacted to determine the proper storage of oxidizers (reference NFPA 430) prior to bringing these materials onsite.*

Keep hazardous material storage locations clean and orderly.

Tightly cover or close chemical/product containers when not in use.

Label storage facilities in accordance with NFPA 704.

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Shipping

Onsite and offsite shipments of hazardous materials are made in accordance with applicable DOT regulations and client-prescribed standards, including the following:

- Packaging and labeling of containers
- Vehicle placarding
- Documentation (such as manifest/bill of lading)
- Vehicle driver training

Transfer and Use of Flammable Liquids

As much as possible, use solvents with the lowest fire hazard and toxic properties.

Keep containers closed except when transfers are being made.

Bond and ground containers when transferring flammable liquids between conductive containers.

Draw or transfer through a closed piping system from safety cans by means of a device drawing through the top or by gravity or pump through an approved self-closing valve. Transferring by means of air pressure is prohibited.

Use approved dispensing devices and nozzles for flammable liquids. Flammable and combustible liquids are not dispensed within 31 meters (100 feet) of open flame or other sources of ignition.

A maximum of a 1-day supply (not exceeding 76 liters [20 gallons]) of flammable liquids is allowed in a work area at 1 time. Return the unused portion of the 1-day supply to the designated storage area at the end of each work shift.

NOTE: *A limited number of flammable spray cans (<5) for incidental use stored outside of flammable cabinets is acceptable but is not recommended.*

Store outside portable tanks at least 6.1 meters (20 feet) away from any buildings. Protect tanks and dispensing units against collision.

EMERGENCY PLANNING

Refer to practice [MSC-PRAC-30459](#), *Emergency Preparedness* for general requirements.

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Ensure communication devices (telephone or radio) are available in the vicinity of each hazardous material storage area.

NOTE: *Due to the nature of certain hazardous materials, phones and radios **must not** be used nearby. Check the MSDS for compatibility and distance requirements.*

The following emergency equipment is in near proximity of each hazardous material storage area:

- Adequate fire protection as follows:
 - At least 1 extinguisher having a capability of at least 40:B is located outside of, but not more than 3 meters (10 feet) from the door opening into an inside liquid storage area.
 - At least 1 extinguisher having a capability of not less than 40:B is located within 9.2 meters (30 feet) of any Class I or Class II liquid storage area that is located outside of an inside liquid storage area.

NOTE: *An acceptable alternate is at least 1 portable extinguisher having a capability of 80:B located between 7.6 meters (25 feet) and 22.9 meters (75 feet) of such a storage area.*

- A minimum of 1 spill-x solvent gun or other absorbent appropriate for the material stored
- A minimum of 1 emergency eyewash station
- Adequate spill control equipment including (but not limited to) salvage drums, shovels, and absorbent materials
- Personal protective equipment appropriate for the hazardous material(s) being stored

NOTE: *Exception: Single, flammable, storage/hazardous material cabinet locations.*

Hazardous Materials and Flammable/Combustible Liquids

Perform a written hazards evaluation for foreseeable incidents for new hazardous material storage areas. The evaluation consists of the following:

- An analysis to identify potential risks to workers, the public, and the environment
- Measures to minimize the probability of events determined to pose a significant risk
- Measures to minimize the severity of the events identified

FORMS

Chemical Inventory Worksheet, subcontractors (Site Form A-6003-412)

RECORDS IDENTIFICATION

Records Capture Table

Name of Document	Submittal Responsibility	Retention Responsibility
Hazards evaluation through JSA	Construction Supervisor/Superintendent	Project Document Control
Chemical Procurement Screening form	Requestor	ECO

REFERENCES

MSC-PRO-10468 *Chemical Management Process*, section 6.3
[MSC-PRAC-30374](#), *Construction Work Package*
[MSC-PRAC-30376](#), *Construction Document Control*
[MSC-PRAC-30459](#), *Emergency Preparedness*
[MSC-PRAC-30483](#), *Compressed Gas Operations*

National Fire Protection Association (NFPA)
 NFPA 30, *Flammable and Combustible Liquids*
 NFPA 430, *Code for the Storage of Liquid and Solid Oxidizers*
 NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*