
CH2M HILL Hanford Group, Inc.	Manual	HNF-IP-0842
	Volume	IX, Safety
STORING AND HANDLING CHEMICALS	Section	4.38, REV 0
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1.0 PURPOSE AND SCOPE

This procedure provides requirements for complying with safe storage and handling requirements for hazardous chemicals and chemical products as directed in DOE 5480.4.

These requirements apply to the storage and handling of small and bulk quantities of pure or mixed chemicals (includes chemical products) at all CH2M HILL Hanford Group, Inc. (CHG) managed facilities.

Analytical laboratories (defined in 29 CFR 1910.1450) must follow the specific storage and handling procedures in the "Chemical Hygiene Plan"

2.0 SOURCES

2.1 Requirements

1. DOE 5480.4, "Environmental Protection, Safety, and Health Protection Standards."
2. 29 CFR 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories."

2.2 References

HNF-IP-0842, RPP Administration.

- Volume IX, Section 4.1, "Hazard Communication Program."
- Volume IX, Section 4.12, "Confined Space."
- Volume IX, Section 5.9, "Flammable/Combustible Liquids."

3.0 IMPLEMENTATION

The provisions of this procedure are effective immediately. Affected personnel shall make themselves aware of the requirements of this procedure.

4.0 RESPONSIBILITIES

The manager/supervisor is to ensure that chemicals are handled and stored according to the requirements of DOE 5480.4 and, as applicable, 29 CFR 1910.1450.

5.0 PROCEDURE

5.1 Line Management

1. Ensure the manufacturer's (or other responsible party's) label on original chemical containers is not removed or defaced. Information must remain legible or the container shall be relabeled.

In certain situations, the required label information may be contained in process sheets, operating instructions, or other written materials instead of attaching labels to individual process containers. However, the alternative method must identify the containers to which the method applies and must convey the required labeling information. In such cases, the alternative method must be explained to the employees working in the area, and the written materials must be readily accessible to such personnel.

2. Ensure the manufacturer's label shows the manufacturer's name and address, the product or chemical name, and appropriate hazard warnings. Additional wording is required on some substances that are regulated by specific OSHA requirements. (If labeling is inadequate, notify Procurement.) Contact your industrial hygienist with any questions.
3. Ensure that a Hanford label that shows the material safety data sheet (MSDS) number and numerical hazard rating has been applied on all secondary chemical containers. Contact your industrial hygienist to obtain the hazard rating.

Chemical materials transferred from the original container into smaller, portable containers are not required to be labeled as long as their subsequent use is limited to the immediate use of the employee who performs the transfer.

4. Ensure before using the chemical that employees read the manufacturer's label and note the warnings.
5. Ensure that employees are familiar with the hazards of chemical materials being used, stored, or handled. Facility-specific and on-the-job hazard training must be provided as required in HNF-IP0842, Volume IX, Section 4.1.
6. Ensure material safety data sheets for each chemical in use or storage is readily accessible to the employees in the work place.
7. Ensure all chemical materials are stored in accordance with the recommendations of the manufacturer, or as indicated by accepted industrial practices. Consult your industrial hygienist for storage specifications. This includes manufacturer's recommendations for temperature, moisture, and humidity control.
8. Ensure segregation of chemicals in storage so the storage area is separate from processing and handling operations and from incompatible materials. Segregation may be achieved with separate storage structures or, when the chemicals are stored in the same building,

with fire walls or intervening space. Specially designed cabinets (such as acid storage cabinets) may also be used to segregate chemicals.

9. Avoid storing chemicals alphabetically. Ensure the following groups of chemicals are stored separate from each other:
 - a. Oxidizers
 - b. Flammable and combustible chemicals
 - c. Unstable chemicals
 - d. Acids
 - e. Caustics

If there are any questions about chemical compatibility, contact your industrial hygienist.

10. Ensure adjacent storage tanks containing incompatible chemicals are provided with separate secondary containment structures to prevent mixing in the event of leaks or tank failure.
11. Ensure proper stacking procedures are followed when storing hazardous materials. Containers should be stacked so that they will not be unstable or become dislodged, fall, and cause a spill, thus creating the possibility of personnel exposure.
12. Ensure chemical storage locations are kept clean and orderly. Keep all chemical/product containers tightly covered or closed when not in use and placed in a designated location.
13. Ensure rotation of new product shipments with existing stock so that the oldest stock is available first. (Write the date they were received on the container of products with a limited shelf life.)
14. Ensure routine inspection of all chemical stock for condition and expiration dates (when provided). Dispose of outdated material properly.
15. Ensure only the chemical inventory necessary for uninterrupted operation is kept to reduce fire, personal exposure, and waste disposal hazards.
16. Ensure the quantity of chemicals outside of designated storage locations is limited to that needed for the job being performed or one day's supply, whichever is less.
17. Ensure Peroxide formers are controlled. Certain chemicals are of particular concern because they may form organic peroxides if stored for a long time or exposed to air or contamination. Organic peroxides are strong oxidizing agents, and may explode when subject to heat or shock (loosening a bottle cap).

Potential peroxide forming chemicals include:

- Isopropyl ether
- Ethyl ether

- Acetaldehyde
- Cyclohexene
- Acetal

18. Ensure quarterly Inspections are made for Peroxide formers.

Record the date on the container when ethers and other peroxide forming chemicals are opened. Inspect the product for crystal formation, change in color, or unusual viscosity at least every three months from that date and before each use.

WARNING

Consider any contaminated, decomposed, or altered materials to be highly unstable and potentially explosive. If such materials are found:

1. Leave the container alone
2. Isolate the area
3. Inform the manager or building emergency director

NOTE: The manager or building emergency director will contact Industrial Hygiene and the Hanford Fire Department to arrange for proper handling and disposal.

19. Ensure separate storage of these products for safety and ease of inspection. Small containers are recommended to reduce storage time.
20. Ensure storage tanks are cleaned. If hazardous chemicals are stored in tanks, proper cleaning is necessary when the tanks are emptied or when the chemical in the tank is changed. Large tanks which have held hazardous or volatile materials create a hazard for both cleaning and/or personnel entry. In addition, the tank is classified as a confined space. Proper precautions must be taken including tank ventilation, oxygen determination, appropriate personal protective equipment, compatible cleaning solutions with tank content before emptying, work teams, and team training for the job. All requirements of procedure (HNF-IP-0842, Volume IX, Section 4.12) must be addressed when tank entry is necessary.
21. Ensure requirements in HNF-IP-0842, Volume IX, Section 5.9, are followed when handling and storing flammable and combustible liquids. Only approved containers and cabinets are used for the storage of flammable materials.

Fire control must be provided, with emergency warning systems and fire suppression systems in buildings where flammables are stored. Bonded and grounded tanks should be used to prevent static build-up.

Drums dispensing flammable liquids must be grounded and the drum must be bonded to the receiving container.

Quantities of flammable materials which may be stored in any one area are limited. Restrictions also limit the number of flammable storage cabinets that may be located in any one fire area.

22. Ensure when chemicals are stored outdoors that these precautions are followed: Barrels and smaller containers of chemicals in a storage yard must be protected/shielded from direct sunlight in order to protect against content degradation, overheating, container bulging, or rupturing.

When flammable storage cabinets are located outdoors, plugs in the vent holes must be removed.
23. Ensure regular inspections are made of chemical storage areas and facilities in order to assure container integrity, compatibility, adequate separation, temperature, moisture, and humidity control.
24. Consult with an industrial hygienist for further guidance in specific storage requirements.
25. Ensure workers are provided with emergency protective equipment that can be used when a failure or accident occurs.
26. Ensure the workers are trained about the hazards in handling the material and what action that should be taken when an exposure is likely to occur.
27. Ensure that, as much as possible, workers are removed from contact with hazardous material. If the system can be automated, the potential for exposure becomes significantly less.
28. Ensure adequate ventilation is provided when handling materials in an open plant area to remove any contaminants that might escape into the workroom air.
29. Ensure that maintenance and clean-up crews are provided with training about the dangers in handling hazardous materials. Training should include emergency procedures and equipment that are necessary in the case of an accidental spill or release.
30. Ensure that outside factors do not cause a potentially dangerous situation. Sparking from equipment operating in a flammable area or the introduction of incompatible materials can cause a potentially harmful exposure to the workers.
31. Ensure proper maintenance of handling equipment to assure that it is operating as designed and will not cause exposure.
32. Ensure the integrity of any packaging and/or transfer containers.
33. Ensure that potential exposures during transfer and handling of hazardous material are minimized when practical, by having it occur during off hours or in relatively vacant areas of the plant.