



## **Subject: NASA Hazardous Chemical Storage Requirements**

**Responsible Office: Office of Safety and Mission Assurance**

### **1. Introduction**

a. The safe storage of hazardous chemicals is an essential part of an environmental, health, and safety program. Chemical storage must meet certain minimum standards to satisfy diverse regulations. These requirements establish the minimum standards that NASA Centers shall follow to meet Federal and Agency regulations. NASA recognizes that some Centers may be required to establish more stringent standards to meet State and local requirements, as applicable. These requirements do not apply to Biological materials storage (see NPR 1800.1 for those requirements).

b. The Office of Safety and Mission Assurance (OSMA), with assistance from the Office of the Chief Health and Medical Office (OCHMO), developed this NASA Interim Directive (NID) to address NASA Office of Inspector General (OIG) recommendation 6 from an audit documented in IG-21-006, NASA's Management of Hazardous Materials. These requirements have been developed in coordination with Center personnel from the safety, fire, and occupational health organizations. Since most Centers have existing policies that meet or exceed the requirements set forth in this Interim Directive, the impact to Center operations is expected to be minimal.

### **2. General Requirements**

a. Hazardous chemicals on hand shall be limited to only the quantities required to properly conduct operations and research.

b. Hazardous chemicals shall be stored in a location that will reduce or eliminate associated risks of storing and handling hazardous chemicals.

c. Hazardous chemicals shall be stored in a location that minimizes the possibility of hazardous vapors entering a building ventilation system.

d. All chemical storage areas and storage cabinets shall be inspected at least quarterly by the manager of the storage area or storage cabinet, or his/her designated representative, to verify integrity of the room and/or cabinet and the hazardous chemical contents stored therein. The inspection shall include, but not be limited to, the integrity of storage shelving; validation that there is no evidence of leaks of liquid, vapor emissions, or unidentified powder residue; examination of any applicable expiration dates; removal of those hazardous chemicals which may be expired; and the overall determination that the hazardous chemicals are stored in a manner that preserves their integrity and safeguards Center personnel from exposure. The manager of the storage area or storage cabinet, or his/her designated representative, shall ensure that applicable Center procedures for the disposal of any unwanted or expired hazardous

chemicals are complied with, including appropriate inventory tracking records (e.g., receipt, inspection, and disposal records).

e. Hazardous chemicals storage considerations shall include temperature, ignition sources, ventilation, segregation, and identification.

f. All containers of hazardous chemicals shall be properly labeled with the identity of the hazardous chemical(s) and appropriate safety hazard warnings.

g. Hazardous chemicals shall only be stored with other compatible chemicals of the same hazard class. Hazardous chemicals shall be desegregated from other groups of chemicals that could cause reactions if mixed. Any deviation from this shall be pre-approved by the manager of the storage area or storage cabinet, or his/her designated representative, and documented by the Center in the chemical hygiene plan.

h. Safety Data Sheets (SDS) for every hazardous chemical shall be on hand or easily accessible to all employees in the workplace, as required by 29 CFR 1910.1200. Employees shall receive training on hazardous chemical handling and storage safety requirements, and the immediate actions (e.g., capture, containment, cleanup, reporting, and evacuation) which must be taken in the event of a spill.

i. Liquid hazardous chemicals shall be stored in the manufacturer recommended containers or double-contained packaging as appropriate.

j. Compressed gas cylinders shall be stored and handled in accordance with OSHA 1910.101, NASA STD-8719.11, and the Compressed Gas Association requirements.

k. Hazardous Materials shall be stored in accordance with OSHA 1910.1200, 1910.1450, NPR 8715.1, NASA STD-8719.11, NASA STD-8719.12, and any local or State requirements, as applicable.

### **3. Storage Cabinet Requirements**

a. Each cabinet shall be clearly labeled as to the hazard class of the materials stored within the cabinet (e.g., Acids, Flammables, etc.).

b. Each cabinet shall be labeled with the name, phone number, and organizational code of the responsible person(s). This requirement also applies to chemicals stored in explosion-proof refrigerators or cold rooms.

c. Each cabinet must be rated for use with the hazard class of the most hazardous chemical content stored.

d. No paper products, office equipment, food, or any other non-hazardous material shall be stored in any hazardous material storage cabinet.

e. Flammable storage cabinets must be listed with an approved testing laboratory (Underwriters Laboratories (UL), Factory Mutual (FM), etc.) for the intended use.

f. Flammable corrosives must be stored in a cabinet rated for both corrosives storage and flammable storage.

g. Cabinets shall have a spill control tray large enough to contain a complete spill from the single largest container.

#### **4. Storage Areas/Rooms Requirements**

a. Storage areas shall be approved for use by the Center Authority Having Jurisdiction (AHJ).

(1) Existing storage areas/rooms shall be reviewed for minimum Code compliance by the AHJ.

(2) New storage areas/rooms shall have the AHJ involved in the design and construction to ensure minimum Code (federal, state, local, or industry standards) compliance.

b. Storage areas shall be labeled according to the type of chemical family or hazard classification contained therein.

c. Each storage area/room shall be labeled with the name, phone number, and organizational code of the responsible person(s). This requirement also applies to chemicals stored in explosion-proof refrigerators or cold rooms.

d. Storage areas/rooms shall be inspected for compliance with these requirements at least quarterly by the manager of the storage area or storage cabinet, or his/her designated representative, and annually by the Center Safety organization, Industrial Hygienist or qualified Fire Department personnel.

e. Storage areas/rooms shall have proper lighting and ventilation and be kept at a consistent temperature appropriate to the hazardous chemical contents stored therein.

f. Ignition sources, such as open flames or heat sources shall not be within or near the storage areas/rooms.

g. Emergency equipment, such as fire extinguishers certified for use on chemical fires shall be easily accessible and in good working order.

h. Hazardous chemical storage areas/rooms shall be able to confine any leaks or spills within the area/room in accordance with NASA STD-8719.11.

i. Shelves shall:

(1) Be structurally sound to support the weight of the chemicals.

(2) Be level, stable, and secured to the wall or another stable surface.

(3) Be kept free of chemical contamination.

(4) Not have containers protruding over the shelf edges.

(5) Not be overcrowded.

(6) Have a spill containment lip or chemicals placed on a spill control tray large enough to contain a complete spill from the single largest container.

(7) Not be used for storage (temporary or permanent) of non-hazardous chemical products.

## **5. Definitions**

**Storage areas/rooms.** A location used for the sole purpose of housing hazardous chemical substances and their associated waste products. Unlike storage lockers, they are large enough to store a number of chemicals within a single space without creating a significant risk of hazardous interactions between chemicals. They also provide enough interior space for employees to move freely and work within.

**Storage cabinets.** Storage units certified by a qualified certification entity and designed to provide several protective functions, such as enhancing chemical security, corrosion resistance, and acting as a fire barrier.