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1.0 PURPOSE

To provide requirements for the use, storage, and dispensing of flammable and combustible liquids at the Paducah Gaseous Diffusion Plant (PGDP).

2.0 APPLICABILITY

This procedure applies to personnel who manage, use, store, or dispense flammable and combustible liquids (including waste liquids) used in operations and incidental activities at PGDP.

Exceptions:

> **NOTE**
>
> New requirements to this procedure shall be implemented within 60 days of the revision's effective date.

2.1 Permanent bulk storage of combustible liquids in process buildings C-310/C-310A, C-315/C-620, C-331, C-333, C-333A, C-335, C-337, and C-337A that comply with the requirements of CP3-FP-2031, "Control of Combustible Material and Ignition Source" are not subject to the requirements of this procedure.

2.2 This procedure does not apply to the transportation of flammable and combustible liquids over public roads. They are required to comply with U. S. Department of Transportation regulations.

2.3 This procedure does not apply to flammable or combustible liquids that are contained within permanent storage tanks and closed piping systems.

2.4 Facilities and equipment installations that are in compliance with the applicable requirements of the following National Fire Protection Association (NFPA) standards shall be deemed to be in compliance with this procedure:

- NFPA 31, "Standard for the Installation of Oil Burning Equipment".
- NFPA 32, "Standard for Drycleaning Plants".
- NFPA 33, "Standard for Spray Application Using Flammable and Combustible Materials".
- NFPA 34, "Standard for Dipping and Coating Processes Using Flammable and Combustible Liquids".
- NFPA 37, "Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines".
- NFPA 45, "Standard on Fire Protection for Laboratories".

2.5 The storage requirements and quantity limits of Section **6.0** do not apply to flammable or combustible liquids in the following facilities:

- C-750 Garage
- C-751 Fuel Dispensing Facility

NOTE

The requirements of Section **6.0** do apply to the handling and transfer of flammable and combustible liquids within the C-750 and C-751 facilities.

2.6 The requirements of Section **6.0** do not apply to flammable or combustible liquids used in the operation of maintenance shop equipment if the equipment is installed and operated in accordance with manufacturer's recommendations. This includes, but is not limited to, liquids used during machining operations, for quench baths, and for dipping operations.

NOTE

The requirements of Section **6.0** do apply to the storage of flammable and combustible liquids prior to and after its use in maintenance shop equipment and to the transfer of the liquids to and from such equipment.

2.7 Consumer products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable when packaged in individual containers not exceeding one gallon in size are exempt from the requirements of Section **6.0**.

2.8 The following flammable/combustible liquids are not significant fire hazards and are exempt from the requirements of Section **6.0**.

- A single bottle of lens cleaner in a cubicle or office.
- A single container of cleaning solvent in a restroom.
- A single can of glue and a single can of primer in a tool box.

3.0 DEFINITIONS/ACRONYMS

3.1 Definitions

See Appendix A.

3.2 Acronyms

A. **CAHJ** — Contractor Authority Having Jurisdiction

B. **DOT** — Department of Transportation

C. **FM** — Factory Mutual Research Corporation

D. **NFPA** — National Fire Protection Association

E. **PCB** — Polychlorinated Biphenyl

F. **UL** — Underwriter's Laboratories

4.0 REFERENCES

4.1 Use References

A. CP3-HS-2003, "Hazard Communication"

B. ES-1.2-7, "Flammable Liquids Storage Cabinet Electrical Grounding Details"

C. ES-1.2-8, "Solvent, Storage, Drum - Grounding Details Class I Flammable Liquids"

D. NFPA 30, "Flammable and Combustible Liquids Code"

E. NFPA 70, "National Electric Code"

F. CP3-FP-2031, "Control of Combustible Material and Ignition Source"

4.2 Source References

A. CP1-NS-3000, *Documented Safety Analysis for the Department of Energy Paducah Site Deactivation Project*

B. 29 CFR 1910.106, "Flammable and Combustible Liquids"

C. NFPA 77, "Recommended Practice on Static Electricity"

D. CP2-CU-CH1031, "Control of Flammable/Combustible Materials in Cylinder Yards" (contact PSS to obtain procedure)

E. NFPA 30A, "Code for Motor Fuel Dispensing Facilities and Repair Garages"

F. NFPA 31, “Standard for the Installation of Oil Burning Equipment”

G. NFPA 32, “Standard for Drycleaning Plants”

H. NFPA 33, “Standard for Spray Application Using Flammable and Combustible Materials”

I. NFPA 34, “Standard for Dipping and Coating Processes Using Flammable and Combustible Liquids”

J. NFPA 37, “Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines”

K. NFPA 45, “Standard on Fire Protection for Laboratories”

5.0 RESPONSIBILITIES

5.1 Organizational Managers

5.1.1 Ensure enforcement of this procedure is implemented by all responsible personnel handling, storing, or transferring flammable and combustible liquids.

5.1.2 Ensure an annual inspection is performed according to this procedure for all flammable and combustible liquids storage cabinets.

5.2 Facility Managers

5.2.1 Ensure use, storage, dispensing, and handling of flammable and combustible liquids are conducted according to this procedure.

5.2.2 Ensure only approved equipment and containers are used for flammable and combustible liquids.

5.2.3 Ensure areas around outdoor areas where flammable and combustible liquids are stored are maintained free of weeds, trash, and other unnecessary combustible material.

5.2.4 Ensure relocation of flammable and combustible liquids storage cabinets is reported to Fire Services to ensure update of bar code inventory.

5.2.5 Ensure placement and relocation of flammable and combustible liquids storage cabinets are according to Steps **6.6.8** through **6.6.10**.

5.2.6 Ensure information, according to this procedure, is provided to personnel who are responsible for performing inspections of flammable and combustible liquids storage cabinets.

5.2.7 Perform an annual inspection of all flammable and combustible storage cabinets and document on Annual Flammable and Combustible Liquids Storage Cabinet Inspection Checklist, CP2-FP-2002 F01

5.3 Procurement

5.3.1 Ensures procurement of flammable and combustible liquids cabinets meet criteria in Step **6.6.4** of this procedure.

5.3.2 Ensures procurement of equipment and containers for use with flammable and combustible liquids are designed and approved for such liquids.

5.3.3 Ensures checks are performed of leak detection monitors installed on fuel tanks located at C-751 fuel dispensing facility.

5.3.4 Ensures preventive measures are taken in controlling leakage of liquids received from off-site shipments.

5.3.5 Oversees fuel transfer operations at the C-751 fuel dispensing facility.

5.4 Contractor Authority Having Jurisdiction

5.4.1 Has responsibility for the interpretation and application of applicable fire codes and standards

5.4.2 Approves deviations to and formal interpretations of fire codes and standards applicable to PGDP.

5.4.3 Reviews and approves engineering drawings and design specifications as applied to the purchase, construction, installation, and modification of flammable and combustible liquids storage tanks, storage facilities, equipment and components.

5.5 Fire Services

5.5.1 Defines requirements and approves alternatives for the proper storage, handling, and use of flammable and combustible liquids not covered in this procedure.

5.5.2 Periodically inspects flammable combustible liquids storage tanks and storage facilities.

5.5.3 As necessary, reviews flammable and combustible liquids storage areas, exterior conditions of flammable and combustible liquids cabinets, and overall guidelines outlined in this procedure.

5.5.4 Ensures portable or fixed fire protection equipment is provided for facilities where flammable and combustible liquids are stored, handled, or used.

5.5.5 Maintains bar code inventory of flammable and combustible liquids storage cabinets.

5.5.6 Inspects and applies Fire Services inspection label (Appendix C, Approval for Use Label - Example), to contractor's and subcontractor's vehicles containing tanks used for the storage and transfer of flammable and/or combustible liquids.

5.5.7 **When** notified of lube oil being unloaded in the Building C-333 or C-337 truck alleys, performs the following:

A. Verifies fire hydrants or portable fire hydrant stations in the immediate area are operable before lube oil is unloaded.

B. Stages a pumper and firefighter(s) near the lube oil unloading station during unloading operation.

5.6 Protective Force

5.6.1 Provides courtesy notification to Fire Services when tanker trucks transporting flammable/combustible liquids enter plant site.

5.6.2 **Until** inspected by Fire Services and documented on approval label, prevents contractor's and subcontractor's vehicles containing tanks used for the storage and transfer of flammable and/or combustible liquids from entering secured area.

5.7 Engineering

5.7.1 Ensures prime construction contractors and construction subcontractors for work on PGDP site store, handle, and use flammable and combustible liquids according to this procedure.

5.7.2 Ensures appropriate groups review drawings and design specifications of new and modified facilities/areas, equipment and components associated with the storage, handling, and use of flammable/combustible liquids.

5.7.3 **When** required, provides instruction and guidance for proper grounding of flammable and combustible liquids storage cabinets according to ES-1.2-7, "Flammable Liquids Storage Cabinet Electrical Grounding Details."

5.7.4 **When** required, provides instruction and guidance for proper grounding and bonding for the transfer of flammable liquids according to ES-1.2-8, "Solvent, Storage, Drum - Grounding Details Class I Flammable Liquids."

5.8 Employees

5.8.1 Ensure applicable JHAs are reviewed prior to performance of this procedure.

5.8.2 Ensure activities involving use, storage, and handling of flammable and combustible liquids are conducted according to this procedure.

5.8.3 **When** possible, minimize use of flammable and combustible liquids in work areas.

5.8.4 **When** requested, perform inspection of flammable and combustible liquids storage cabinets according to this procedure.

6.0 ACTION STEPS

6.1 Outdoor Storage of Flammable and Combustible Liquids

NOTE

Storage of containers and tanks that are protected from the weather by a canopy or roof that does not limit the dissipation of heat or dispersion of flammable vapors and does not restrict fire-fighting access and control shall be treated as outdoor storage according to this section. Storage of containers and tanks in tent type structures shall also be treated as outdoor storage.

6.1.1 Outdoor storage of flammable and combustible liquids in containers and portable tanks shall be in accordance with **Table 1 in Appendix D**.

6.1.2 The distances from outdoor storage to the nearest building listed in **Table 1** may be reduced if additional requirements specified in NFPA 30 are satisfied.

6.1.3 **When** two or more classes of liquids are stored in a single pile, the storage height and quantity limits for that pile shall be the smallest of the applicable limits specified in **Table 1**.

6.1.4 New outdoor storage areas shall be graded in a manner to divert possible spills away from buildings or shall be surrounded by a curb at least 6 inches high. When curbs are used, provisions shall be made for draining of accumulations of ground or rain water or spills of liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.

6.1.5 Outdoor storage areas shall be kept free of weeds, debris, and other combustible materials not necessary to the storage.

6.1.6 Outdoor storage areas shall be identified to warn personnel of dangers of smoking and open flames. Example: Post signs leading into such areas with the warning FLAMMABLE-KEEP FIRE AND OPEN FLAMES AWAY

6.2 Separate Inside Storage of Flammable and Combustible Liquids

NOTE

A separate inside storage area is a room or building used for the storage of liquids in containers or portable tanks and is separated from other rooms or buildings. Such areas may include an inside room which is totally enclosed within a building and has no exterior walls, a cut-off room which is within a building and has at least one exterior wall, or an attached building which has only one common wall with another building that is not used for liquid storage.

6.2.1 An inside room used for the storage of flammable and combustible liquids shall comply with the following requirements:

A. The room shall be separated from other areas of a building by walls, floors, and ceilings having the fire-resistance ratings specified in **Table 2 in Appendix D**.

B. Quantity of liquids stored in the room shall comply with the **Table 2 in Appendix D**.

C. Openings in the walls, floors, and ceilings of the room shall be protected in accordance with NFPA 30.

D. The room shall be provided with either a gravity or a continuous mechanical exhaust ventilation system. Mechanical ventilation shall be used if Class I liquids are dispensed within the room.

E. An aisle at least 3 ft wide shall be maintained in the room so that no container is more than 12 ft from the aisle.

F. Containers over 30 gallons capacity storing Class I or Class II liquids shall not be stored more than one container high and Class III liquids shall not be stored more than two containers high.

G. In rooms where dispensing of Class I liquids is permitted, electrical systems shall comply with NFPA 70 requirements for hazardous locations.

H. Class I liquids shall not be permitted in the room **if** it is located in a basement area.

I. For new inside rooms, refer to NFPA 30 for additional design requirements.

6.2.2 A cut-off room or attached building used for the storage of flammable and combustible liquids shall comply with the following requirements:

A. The cut-off room or attached building shall be separated from other rooms or buildings by interior walls, floors, and ceilings having the fire-resistance ratings specified in **Table 3 in Appendix D**. The roof and exterior walls shall have the same fire-resistance rating.

B. Quantity of liquids stored in the room or building shall comply with either **Table 4** or **Table 5 in Appendix D**.

C. Openings in the walls, floors, and ceilings of cut-off room or attached building shall be protected in accordance with NFPA 30.

D. A cut-off room or attached building that is not protected by an automatic sprinkler system shall comply with the storage height and quantity limits specified in **Table 4**.

E. A cut-off room or attached building that is protected by an automatic sprinkler system shall comply with the storage height and quantity limits specified in **Table 5 in Appendix D**.

NOTE

The storage height and quantity limits in **Table 5** apply to single story structures. For requirements for multiple story structures or structures with basements, refer to NFPA 30.

F. **When** two of more classes of liquids are stored in a single pile, the maximum height and quantity in that pile shall be the smallest of the limits specified in **Tables 4** or **5**.

G. Class I liquids shall not be permitted in basement areas. Class II and Class III liquids may be stored in basement areas **if** automatic sprinkler protection is provided.

H. Dispensing operations of Class I or Class II liquids are not permitted in cut-off rooms or attached buildings exceeding 1,000 sq ft floor area.

I. In rooms where Class I liquids are dispensed, electrical systems shall comply with NFPA 30 and with NFPA 70 requirements for hazardous locations.

J. Storage areas shall be provided with either a gravity or a continuous mechanical exhaust ventilation system. Mechanical ventilation shall be used where Class I liquids are dispensed.

K. For a new cut-off room or attached building, refer to NFPA 30 for additional requirements.

6.2.3 A cut-off room or attached building shall be identified to warn personnel of dangers of smoking and open flames. Example: Mark doors leading into such areas with the warning FLAMMABLE-KEEP FIRE AND OPEN FLAMES AWAY.

6.3 Storage of Flammable and Combustible Liquids in Warehouses

NOTE

Warehouses used to store flammable and combustible liquids are of two types - general-purpose warehouses and liquid warehouses. A general-purpose warehouse is a separate, detached building used only for warehousing-type operations and may contain other commodities. A liquid warehouse is a separate, detached building or an attached building used for warehousing-type operations for liquids only.

6.3.1 General-purpose and liquid warehouses used for the storage of flammable and combustible liquids shall be separate, detached buildings or shall be separated by fire walls having the following fire resistance ratings:

A. **If** the warehouse is located more than 10 ft but less than 50 ft from another building, the separating wall shall have a fire-resistance rating of 2 hr.

B. **If** the warehouse is located 10 ft or less from another building, the separating wall shall have a fire-resistance rating of 4 hr.

C. **If** the warehouse is located more than 50 ft from another building, it is considered a separate detached building and a fire wall shall not be required.

6.3.2 Openings in separation fire walls shall be protected according to NFPA 30.

6.3.3 A general-purpose warehouse used for the storage of flammable and combustible liquids shall comply with the following requirements:

A. A general-purpose warehouse shall comply with the container size, storage height, and quantity limits specified in **Table 6 in Appendix D.**

B. **When** two of more classes of liquids are stored in a single pile, the maximum height and quantity in that pile shall be the smallest of the applicable limits specified in **Table 6**.

C. Class I and Class II liquids in plastic containers shall not be stored in general-purpose warehouses.

D. Class I liquids shall not be permitted in basement areas. Class II and Class III liquids may be stored in basement areas **if** automatic sprinkler protection is provided.

E. Liquids in containers and portable tanks may be stored on pallets or in solid piles subject to the quantity and height limits of **Table 6**.

F. Palletized or solid pile storage shall be arranged so that piles are separated from each other by at least 4 ft aisles. Aisles shall be provided so that no container is more than 12 ft from an aisle. Main aisles shall be a minimum of 8 ft wide.

G. **Where** other commodities are stored in the same area as liquids, the minimum distance between the two types of storage shall be 8 ft.

H. **Where** liquids are packaged together with other commodities, as in kits, the storage shall be considered on the basis of whichever commodity predominates.

6.3.4 A liquid warehouse used for the storage of flammable and combustible liquids shall comply with the following requirements:

A. The total quantity of liquids within a liquid warehouse shall not be restricted.

B. Liquids in containers may be stored on pallets or in solid piles.

C. **If** the liquid warehouse is protected by an automatic sprinkler system, the maximum pile height and maximum quantity per pile shall comply with **Table 5**.

D. **If** the liquid warehouse is not protected by an automatic sprinkler system, the maximum pile height and maximum quantity per pile shall comply with **Table 4**.

E. **When** two of more classes of liquids are stored in a single pile, the maximum height and quantity in that pile shall be the smallest of the applicable limits specified in **Tables 4** or **5**.

F. Class I liquids shall not be permitted in basement areas. Class II and Class III liquids may be stored in basement areas **if** automatic sprinkler protection is provided.

G. Containers in piles shall be separated by pallets or dunnage to provide stability and to prevent excessive stress on container walls. Portable tanks stored over one tier high shall be designed to nest securely, without dunnage.

H. Solid pile and palletized storage shall be arranged so that piles are separated from each other by at least 4 ft. Aisles shall be provided so that no container or tank is more than 12 ft from an aisle. Main aisles shall be a minimum of 8 ft wide.

I. Empty or idle combustible pallet storage shall be limited to a maximum pile size of 2,500 sq ft and to a maximum storage height of 6 ft. Idle pallet storage shall be separated from liquid storage by at least 8 ft. wide aisles.

6.3.5 For a new general-purpose or liquid warehouse, refer to NFPA 30 for additional requirements.

6.3.6 A general-purpose or liquid warehouses shall be identified to warn personnel of dangers of smoking and open flames. Example: Mark doors leading into such areas with the warning FLAMMABLE-KEEP FIRE AND OPEN FLAMES AWAY.

6.4 Incidental Storage of Flammable and Combustible Liquids

NOTE

The requirements of Section **6.4** do not apply to liquid storage in process buildings C-310/C-310A, C-315/C-620, C-331, C-333, C-333A, C-335, C-337, and C-337A. Refer to procedure CP3-FP-2031, "Control of Combustible Material and Ignition Source" for guidance on these facilities.

6.4.1 Limit the quantity of flammable and combustible liquids that are stored in a building, but are outside of approved locations (ie. inside storage rooms, cut-off rooms or attached buildings, general-purpose or liquid warehouses, or storage cabinets) according to the requirements of this section.

6.4.2 Incidental liquid storage may be allowed if the storage does not exceed the sum of the following:

A. 25 gallons of Class IA liquids in containers; and

B. 120 gallons of Class IB, IC, II, or III liquids in containers.

6.4.3 Maintain at least 100 foot spacing be between each concentration (or grouping) of incidental liquid storage or distribute the storage so that the quantity limits are not exceeded in any 100 foot by 100 foot area.

6.4.4 **Where** incidental quantities of liquids in excess of the above limits are needed to supply an operation for one continuous 24 hour period, allow the greater quantity.

6.4.5 Individual containers used for incident liquid storage shall not exceed a capacity of 60 gal.

6.4.6 **When** storage of liquids in excess of the above limits is required, the applicable storage requirements of either Sections **6.1**, **6.2**, **6.3**, **6.5** or **6.6** shall be met.

6.5 Class III Liquid Storage and Dispensing Areas

NOTE

The requirements of Section **6.5** only apply to the C-600 steam plant, the C-611 water treatment plant, C-620 air plant, and the C-631, C-633, C-635, and C-637 pump houses.

6.5.1 Store and dispense Class III oils and lubricants that are routinely used to support equipment operation in designated areas in the C-600 steam plant, the C-611 water treatment plant, C-620 air plant, and the C-631, C-633, C-635, and C-637 pump houses.

6.5.2 Limit the total quantity of Class III liquids in the storage and dispensing area to not more than, 600 gal in the C-600 steam plant, the C-611 water treatment plant, C-620 air plant, and not more than 300 gal for the C-631, C-633, C-635, and C-637 pump houses.

6.5.3 Individual containers of the Class III liquids shall not exceed a capacity of 60 gal.

6.5.4 Do not store more than one container high, containers of Class III liquids with a capacity of over 30 gal.

6.5.5 Do not allow the storage of Class I and Class II liquids in the storage and dispensing area unless they are located in a flammable and combustible liquid storage cabinet.

6.5.6 Protect the storage and dispensing area with an automatic sprinkler system.

6.6 Flammable and Combustible Liquids Storage Cabinets

NOTE

Not all flammable and combustible liquids storage cabinets specify maximum quantity limits. Cabinets with a physical capacity of less than or equal to 60 gallons are inherently in compliance with **Step 6.6.1B.2)**.

6.6.1 Storage of flammable and combustible liquids in cabinets shall not exceed the following limits:

A. Quantities of liquids shall **not** exceed maximum limits as designated on the cabinet by the manufacturer.

B. **If** quantities are not provided on cabinet by the manufacturer, the following shall apply:

1) Total quantities of Class I, Class II, and Class III liquids shall not exceed 120 gallons.

2) Of the 120 gallons total, no more than 60 gallons of Class I and Class II liquids shall be permitted.

6.6.2 Unless separated by at least 100 feet, no more than three flammable and combustible liquids storage cabinets shall be located together in a group in areas that are not protected by an automatic sprinkler system.

6.6.3 No more than six flammable and combustible liquids storage cabinets shall be located together in a group in areas that are protected by an automatic sprinkler system.

6.6.4 Flammable and combustible liquids storage cabinets shall meet at least one of the following:

A. Underwriters Laboratory (UL) listed

B. Factory Mutual Research Corporation (FM)-approved

C. NFPA 30 Code design requirements

6.6.5 Mark flammable and combustible liquids storage cabinets in conspicuous lettering, FLAMMABLE-KEEP FIRE AWAY.

NOTE

Storage cabinets shall not be vented.

6.6.6 Cabinet owners ensure approved vent bungs with gasket seals are in place and secure.

6.6.7 Locate flammable and combustible liquids storage cabinets in process buildings C-310/C-310A, C-315/C-620, C-331, C-333, C-333A, C-335, C-337, and C-337A, a minimum of 20 feet from the following:

A. Lube oil pits

B. Emergency diesel generators and associated fuel oil tanks

C. Lube oil piping which could be impacted by vehicular traffic

D. Hydraulic equipment

6.6.8 Locate flammable and combustible liquids storage cabinets in process building C-337, a minimum of 17 feet from process electrical transformers containing oil and/or Polychlorinated biphenyl.

6.6.9 Unless approved by Fire Services, do **not** locate flammable and combustible liquids storage cabinets in the following areas:

A. Office areas

B. Fixed weld shops

C. Basements

D. Battery rooms

E. Truck alleys

F. Tunnels

G. Emergency egress pathways

H. Under stairways

I. Within 35 feet of smoking areas

6.6.10 Ensure an annual inspection is performed according to this procedure for all flammable and combustible liquids storage cabinets. See Annual Flammable And Combustible Liquids Storage Cabinet Inspection Sheet, Form CP2-FP-2002 F01 (Attached).

6.6.11 Minimize storage of incidental materials such as rags, paint brushes, procedures, etc., in flammable and combustible liquids storage cabinets.

6.6.12 Cabinet owners shall inspect cabinets annually to ensure doors properly close and latch.

6.6.13 Cabinet owners shall annually inspect **internal and external** condition of cabinets to ensure no physical damage, corrosion, or deterioration is present which may prevent the cabinet from being used for safe storage of flammable and combustible liquids storage.

6.6.14 Cabinet owners shall ensure quantities of Class I, II, and III liquids do not exceed those provided in Step **6.6.1** of this procedure.

6.6.15 Cabinet owners shall ensure cabinets have **not** been modified, such that the integrity of the cabinet has been compromised.

6.6.16 **If** a cabinet is found to be degraded, cabinet owner requests Fire Services to review cabinet and recommend corrective actions.

NOTE

Flammable and combustible liquids storage cabinets are not designed for transferring of liquids and, therefore, are **not** required to be grounded.

6.6.17 **If** ground wire(s) are connected to flammable and combustible liquids storage cabinet, cabinet owner performs the following:

A. Requests ground wire(s) to be **disconnected and removed** from cabinet.

B. Patches or seals holes that were drilled in cabinet, for purposes of a grounding lug, with an approved UL-listed or FM-approved minimum 1-hour, fire-resistive sealer.

6.6.18 Cabinet owner shall ensure a bar code label is secured to each cabinet. **If** the bar code label is not affixed to a cabinet, notify Fire Services.

6.7 Flammable and Combustible Liquids Containers

WARNING

When using flammable and combustible liquids in laboratories, injuries could be sustained if such liquids are used or stored near open flames or heating elements.

NOTES

Flammable and combustible liquids used regularly in designated laboratories, such as C-710, may be stored in the immediate work area without being placed in flammable and combustible liquids cabinets.

Common consumer products, when packaged according to commonly accepted practices for retail sales, shall be exempt from the requirements of this section.

6.7.1 Store flammable and combustible liquids in original shipping containers in an inside storage room, cut-off room or attached buildings, general-purpose or liquid warehouse, or other approved storage area.

6.7.2 **If** flammable or combustible liquids are transferred from their original shipping container into another container, the container used for the handling, storage, and transfer of flammable or combustible liquid shall be DOT authorized, UL listed and/or FM approved, or comply with an applicable NFPA or other industry standard.

6.7.3 Mark containers with flammable and combustible liquids according to CP3-HS-2003, “Hazard Communication.”

6.7.4 Safety cans shall have manufacturer’s wire mesh flame arrestor installed in their pour spout.

6.7.5 Safety cans shall have functional self-closing lids.

6.7.6 Space shall be left in safety cans to allow for expansion of contents due to increased temperatures.

6.7.7 No smoking, open flames, **or** spark producing activities shall be conducted within 35 feet of areas where flammable or combustible liquids are stored, handled, used, or dispensed.

6.7.8 **If** a safety can containing a flammable or combustible liquid is damaged or found to be leaking, perform the following:

A. Move container to the outside of the building and away from emergency egress exits.

B. Transfer contents to another approved safety container.

C. Clean up any spilled liquids.

D. **If** a large spill has occurred, contact the Environmental Group for directions and have Fire Services stand by while cleanup is accomplished.

E. Properly dispose of damaged safety can and absorbent materials used for cleanup.

6.7.9 The maximum allowable size of containers and portable tanks shall not exceed that specified in **Table 7 in Appendix D**.

6.8 Dispensing Flammable and Combustible Liquids

WARNING

Filling portable containers inside pickup beds equipped with bed liners may cause an explosion hazard.

6.8.1 Remove container(s) from vehicles before filling with flammable or combustible liquids.

NOTE

Hoses or faucets used for transferring flammable and combustible liquids are to be UL-listed and/or FM-approved and equipped with operable self-closing valves without hold open latches.

6.8.2 Employees who transfer Class I and Class II liquids into approved containers or portable tanks, perform one of the following:

A. For transfers from metal container to metal container:

1) Maintain container-to-container contact during entire filling operation.

2) **If** unable to maintain container-to-container contact during fitting, use approved bond wire connected to pouring spout and container being filled.

B. For transfers to containers of glass or other nonconducting materials with a capacity of 5 gallons or less, the transfer may be conducted without bonding wire attached.

C. Transferring the liquid through a closed piping system.

6.8.3 For protection against static sparks during loading or unloading of tank vehicles containing flammable liquids, implement Engineering Standard ES-1.2-8 for the following:

A. Activities where Class I liquids are loaded or unloaded.

B. Activities where Class II or Class III liquids are loaded or unloaded into vehicles that may contain vapors from previous cargoes of Class I liquids.

6.8.4 The size of containers of Class I and Class II liquids to be used for transfers from the bed of a pickup truck shall be limited to **no** more than one 55-gallon drum or one tank of not greater than 275-gallon capacity.

6.8.5 **If** dispensing gasoline or diesel fuel from a tank truck, as a minimum, follow steps in Appendix B, Regulations for Fuel Tank Trucks.

6.8.6 **If** filling a cargo tank from the top dome with a Class I or Class II liquid, contact Fire Services for direction.

6.8.7 Do not fill vehicles, mobile equipment, or other containers inside buildings unless approved by the AHJ.

6.9 Special Notifications

6.9.1 **When** unloading lube oil in Building C-333 or C-337 truck alleys, notify Fire Services for compensatory actions to be taken (refer to Section **5.5.7**).

> **NOTE**
>
> Approval labels are placed on contractor's and subcontractor's vehicles containing flammable and combustible liquids fuel tank(s). See Appendix C.

6.9.2 Security ensures contractor's and subcontractor's vehicles containing flammable or combustible liquid fuel tanks have been inspected by Fire Services and documented on label.

> **NOTE**
>
> Labels are typically good for 30 days.

6.9.3 Protective Force ensures label has not expired.

6.9.4 **If** label has expired, Security requests Fire Services to inspect vehicle and tanks.

6.9.5 Fire Services inspects contractor's and subcontractor's vehicles containing tanks used for the storage and transfer of flammable and/or combustible liquids according to the following criteria:

A. A UL- and/or FM-approved portable fire extinguisher.

B. Extinguisher is properly filled and has a minimum Class 40-B rating.

C. Extinguisher is securely mounted and located so it is readily accessible in case of a fire emergency.

D. **If** extinguisher is in a location other than within the driver's compartment, its location is indicated by appropriate markings on the exterior of the vehicle.

E. Ensures truck and tank is free from flammable and combustible liquids leaks and appears to be in good condition.

F. Tank(s) are properly labeled with product name or UN number such as: “Flammable” or “Combustible” placard, UN “1203" for gas placard, UN “1993" for diesel fuel placard.

G. **If** tank is gasoline tank, ensure it includes specification markings. Diesel fuel tanks are not required to be a specification tank.

6.9.6 **If** equipment and container meet the above criteria, completes label.

6.9.7 Secures and positions label to flammable and/or combustible liquid tank so it can be easily read.

6.9.8 Contact CAHJ for appropriate fire protection measures not addressed in this procedure.

7.0 RECORDS

7.1 Quality

None

7.2 Nonquality

CP2-FP-2002 F01, Annual Flammable/Combustible Liquid Storage Cabinet Inspection Checklist

Appendix A
DEFINITIONS

NOTE

The following definitions are provided to define terms to ensure safe use of flammable and combustible liquids. Not all definitions are used in the body of the procedure.

A. **Approved** — As applied to FM, UL, or the AHJ.

B. **Basement** — A story of a building or structure having one-half or more of the height below ground level and to which access for fire fighting purposes is unduly restricted.

C. **Boiling Point** — Temperature at which a liquid exerts a vapor pressure of 14.7 psia.

D. **Bonding** — The process of connecting two or more conductive objects by means of a conductor.

E. **Building** — Any structure used or intended for supporting or sheltering any use or occupancy.

F. **Bulk Tank -** A tank having a capacity of greater than 120 gallons.

G. **Cargo Tank** — Any tank having a liquid capacity in excess of 110 gallons used for carrying flammable and combustible liquids or asphalt and mounted permanently or otherwise upon a tank vehicle. The term "cargo tank" does not apply to any container used solely for the purpose of supplying fuel for the propulsion of the tank vehicle upon which it is mounted.

H. **Combustible Liquid** — Liquid containing a flash point at or above 100°F. Combustible liquids are subdivided as follows:

- **Class II** includes liquids having closed-cup flash points at or above 100°F and below 140°F. Examples: Kerosene, fuel oils No. 1-D and No. 2-D, mineral spirits.

- **Class IIIA** includes those liquids having closed-cup flash points at or above 140°F and below 200°F. Examples: Asphalt, fuel oils No. 4-5-6, and brake fluid.

- **Class IIIB** includes liquids with closed-cup flash points at or above 200°F. Example: Lube Oil.

Appendix A (Continued)
Page 2 of 4

I. **Container** — Any vessel of 60 U.S. gallons or less capacity used for transporting or storing liquids.

J. **Container, Closed** — As herein defined, as sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

K. **Flammable Liquids** — Liquids containing a flash point below 100°F. Class I liquids are subdivided as follows:

- **Class IA** includes those liquids having closed-cup flash points below 73°F and having a boiling point below 100°F. Example: Pentane.

- **Class IB** includes those liquids having closed-cup flash points below 73°F and having a boiling point at or above 100°F. Examples: Naphtha, benzene, denatured alcohol, gasoline, crude petroleum, and toluene.

- **Class IC** includes those liquids having closed-cup flash points at or above 73°F and below 100°F. Example: Xylene.

L. **Flammable and Combustible Liquids Storage Cabinet** — A cabinet designed and constructed according to NFPA Code 30 requirements, UL Listed, FM approved or a cabinet approved in writing from the Fire Services AHJ.

M. **Flammable (Explosive) Range** — The range of concentrations of flammable vapor or uniform gas-air mixture between which, and at which, propagation of flame or an explosion can occur.

N. **Flash Point** — The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.

O. **Grounding** — The specific form of bonding that connects one or more conductive objects to ground.

P. **Incidental Use** — Applies to an area in review where storage and use of flammable or combustible liquids is occasional. In application of incidental use of liquids, it is the maximum quantity required for a single working shift or subordinate activity. Example: Lube oil activities in process buildings.

Q. **Ignition Temperature** — The minimum temperature required to initiate or support self-sustained combustion independent of an ignition source.

Appendix A (Continued)
Page 3 of 4

R. **Listed/Labeled** — Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization acceptable to the AHJ. Signifies a device or product tested for fire hazards and safety and listed as approved equipment by nationally recognized independent testing laboratories.

S. **Liquid** — For the purpose of this procedure, any material that has a fluidity greater than that of 300 penetration asphalt **when** tested with American Society for Testing and Materials D 5, "Test for Penetration for Bituminous Materials." **When** not otherwise identified, the term liquid shall mean both flammable and combustible liquids.

T. **Non-Bulk Tank —** A tank having a capacity of 119 gallons or less.

U. **Permanent Fuel Tank —** A tank or container with a capacity of >660 gallons that typically requires a secondary containment system, such as a dyke or double-walled container.

V. **Portable Fuel Tank** — A tank or container with a capacity of <660 gallons and does not require a secondary containment system unless used in permanent applications or subject to special hazards.

W. **Water-miscible Liquid** — A liquid that mixes in all proportions with water without the use of chemical additives, such as emulsifying agents.

X. **Portable Tank** — A closed container having a liquid capacity over 60 U.S. gallons and not intended for fixed installation.

Y. **Safety Can** — An approved container, of not more than 5-gallon capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

Z. **Self-Closing Safety Faucet** —A faucet listed for the use in dispensing flammable or combustible liquids from drums. When released the faucet will automatically close to stop flow of product.

AA. **Separate Inside Storage Area** — A room or building used for the storage of liquids in containers or portable tanks, separated from other buildings. Such areas include:

- **Inside Room** — A room totally enclosed within a building and having no exterior walls.
- **Cut-Off Room** — A room within a building and having at least one exterior wall.
- **Attached Building** — A building having only one common wall with another building having different types of occupancies (or functions).

Appendix A (Continued)
Page 4 of 4

BB. **Specific Gravity** — For the purpose of this procedure, specific gravity is a ratio of the weight of a liquid substance to the weight of an equal volume of water.

CC. **Service Station** — That portion of PGDP property where liquids used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles and includes any facilities available for servicing of tires, batteries, and accessories for automotive maintenance work.

DD. **Storage Room/Location/Facility** — Specifically designed for flammable and combustible liquids. The design includes continuous ventilation, electrical equipment specifically designed for such hazardous location, and sources of ignition are controlled and/or segregated from such areas. These rooms/locations/facilities are reviewed and approved by Fire Protection Engineering.

EE. **Tank Truck/Vehicle** — Any single self-propelled motor vehicle, tank truck, tank trailer, or tractor and semi-trailer combination equipped with a cargo tank mounted thereon and used for the transportation of flammable and combustible liquids.

FF. **Vapor Density** — The relation of the weight of a volume of vapor to the weight of an equal volume of air. A figure less than 1.00 indicates a vapor lighter than air and a figure greater than 1.00 is heavier than air.

GG. **Warehouses** —

- **General-Purpose Warehouse** — A separate, detached building or portion of a building used only for warehousing type operations..

- **Liquid Warehouse** — A separate, detached building or attached building used for warehousing type operations for liquids..

HH. **Welding/Burning/Hotwork** — All methods of welding; arc and torch cutting; open flame brazing, burning, and soldering; other portable torch open-flame operations; and other spark producing operations.

Appendix B
REGULATIONS FOR FUEL TANK TRUCKS

A. **If** possible, avoid traveling on roads adjacent to cylinder yards.

B. Ensure no smoking, open flames, or hot work activities is permitted within 35 feet of a vehicle or tank which is being refueled.

C. Maintain constant attendance of refueling operations.

D. **When** loading or unloading a tank truck, ensure brakes are set.

E. The tank vehicle flasher lights shall be in operation while dispensing operations are in progress.

F. Do **not** block open nozzles during tank and vehicle filling operations.

G. For Class I liquids, ensure bonding connections are established before raising dome covers and remain in place **until** filling is completed and dome covers are closed and secured.

H. Do **not** fill vehicles, mobile equipment or other containers inside buildings unless approved by the CAHJ.

I. Do **not** fill containers with a liquid other than liquid for which container is labeled.

J. Provide space in fuel tanks of vehicles, containers, and tanks to allow for expansion of contents due to increased temperatures.

K. The motors of all equipment being fueled shall be shut off during the fueling operation **except** for emergency generators, pumps, and so forth, where continuing operation is essential.

L. To minimize accumulation of static electricity, maintain metal to metal contact between nozzle and container during liquid transfer operations.

M. Ensure a fire extinguisher is available within the immediate area (on truck is considered immediate area) before dispensing operations.

N. Ensure approval of Fire Services and plant shift superintendent is provided before fuel delivery truck entering buildings, switchyards, or truck alleys.

O. Do **not** enter cylinder yards with fuel delivery truck.

Appendix C
APPROVAL FOR USE LABEL — EXAMPLE

Page 1 of 1

FIRE SERVICES DEPARTMENT APPROVED

The equipment approved for use as follows: _____

_____

Date of Issue: _____ Expiration Date: _____

_____

CAHJ or Authorized Fire Services Department Representative

Appendix D
TABLES

Table 1. Outdoor Liquid Storage in Containers and Portable Tanks

Class	Maximum Container Storage Per Pile		Maximum Portable Tank Storage Per Pile		Distance Between Piles	Distance To Nearest Building	Distance To Nearest Street
	Gallons	Height (ft)	Gallons	Height (ft)			
IA	1,100	10	2,200	7	5	200	10
IB	2,200	12	4,400	14	5	200	10
IC	4,400	12	8,800	14	5	200	10
II	8,800	12	17,600	14	5	100	5
III	22,000	18	44,000	14	5	40	5

Table 2. Separate Inside Room Storage Requirements

Automatic Sprinkler System Provided	Fire Resistance Rating (hours)	Maximum Floor Area (sq ft)	Total Allowable Liquid Quantities (gallons per sq ft of floor area)
Yes	2	500	10
No	2	500	4*
Yes	1	150	5
No	1	150	2

* The total allowable quantities of Class IA and IB liquids shall also not exceed that permitted in **Table 4**.

Appendix D (Continued)
Page 2 of 4

Table 3. Cut-off Room and Attached Building Storage Requirements

Automatic Sprinkler System Provided	Fire Resistance Rating (hours)	Total Floor Area (sq ft)	Total Allowable Liquid Quantities
Yes	2	>300	See **Table 5**
No	2	>300	See **Table 4**
Yes	1	≤300	See **Table 5**
No	1	≤300	See **Table 4**

Table 4. Indoor Unprotected Storage of Liquids in Containers and Portable Tanks

	Container Storage			Portable Tank Storage		
Class	**Maximum Pile Height (ft)**	**Maximum Quantity per Pile (gal)**	**Maximum Total Quantity (gal)**	**Maximum Pile Height (ft)**	**Maximum Quantity per Pile (gal)**	**Maximum Total Quantity (gal)**
IA	5	660	660	----	Not Permitted	----
IB	5	1,375	1,375	7	2,000	2,000
IC	5	2,750	2,750	7	4,000	4,000
II	10	4,125	8,250	7	5,500	11,000
IIIA	15	13,750	27,500	7	22,000	44,000
IIIB	15	13,750	55,000	7	22,000	88,000

Appendix D (Continued)
Page 3 of 4

Table 5. Indoor Protected Storage of Liquids in Containers and Portable Tanks

	Container Storage			Portable Tank Storage		
Class	**Maximum Pile Height (ft)**	**Maximum Quantity per Pile (gal)**	**Maximum Total Quantity (gal)**	**Maximum Pile Height (ft)**	**Maximum Quantity per Pile (gal)**	**Maximum Total Quantity (gal)**
IA	5	3,000	660	----	Not Permitted	----
IB	5	5,000	1,375	7	20,000	40,000
IC	5	5,000	2,750	7	20,000	40,000
II	10	10,000	8,250	14	40,000	80,000
III	15	15,000	27,500	14	60,000	100,000

Table 6. General-purpose Warehouse Storage of Liquids in Containers and Portable Tanks

Class	**Maximum Container Size (gal)**	**Maximum Storage Height (ftl)**	**Maximum Quantity (gal)**
IA	Not Permitted	----	----
IB	1	5	660
IC	1	5	660
II	5	5	1,375
IIIA	60	10	2,750
IIIB	60	15	13,750

Appendix D (Continued)
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Table 7. Maximum Allowable Size of Containers and Portable Tanks

Container Type	Class IA	Class IB	Class IC	Class II	Class III
Glass	1 pt	1 qt	1 gal	1 gal	5 gal
Metal (other than DOT drums) or approved plastic	1 gal	5 gal	5 gal	5 gal	5 gal
Safety Cans	2 gal	5 gal	5 gal	5 gal	5 gal
Metal Drum (DOT Spec.)	60 gal	60 gal	60 gal	60 gal	60 gal
Approved Metal Portable Tank	660 gal	660 gal	660 gal	660 gal	660 gal

CP2-FP-2002-F01 - ANNUAL FLAMMABLE AND COMBUSTIBLE LIQUIDS STORAGE CABINET INSPECTION CHECKLIST

Location/Building/Column #:	**Bar Code #:**	**Date:**

STEPS	**SATISFACTORY**	**UNSATISFACTORY**
Note: Section 6.6 provides additional details**.**		
1) Doors shall be properly closed and latched.	□	□
2) Absence of physical damage, corrosion or deterioration. (external or internal)	□	□
3) Absence of modification that compromises cabinet integrity	□	□
4) The bung plugs are in place.	□	□
5) The word **FLAMMABLE** and phrase "KEEP FIRE AWAY" are displayed across the front of the cabinet.	□	□
6) Total quantities of Class I, II, and III liquids shall not exceed 120 gallons. Of the 120 gallon total, no more than a combined 60 gallons of Class I and II shall be permitted.	□	□
7) Portable containers inside a cabinet shall be 5-gallon or less capacity limit (special authorization by the AHJ is required for exceptions).	□	□
8) Aerosol containers stored in the cabinet shall be less than the 5-gallon capacity limit	□	□
9) If any "Unsatisfactory" block was checked, perform the following. Document problems in comment section of inspection sheet and write an ATR (if interpretations of requirements are needed, contact AHJ.)		

Liquid Classification Examples (see definitions for details)

IA	Pentane
IB	Naphtha, benzene, denatured alcohol, gasoline, crude petroleum, toluene
IC	Xylene
II	Kerosene, fuel oils No. 1-D and No. 2-D, mineral spirits
IIIA	Asphalt, fuel oils No. 4-5-6, brake fluid
IIIB	Lube oil

COMMENTS:

Inspection Performed by: