

CENTRAL STATE HOSPITAL
PLAN

SUBJECT: **SAFE USE HANDLING AND STORAGE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS**

ANNUAL REVIEW MONTH: APRIL

RESPONSIBLE FOR REVIEW: CSH SAFETY DIRECTOR

LAST REVISION COMPLETED: April 2008

I. SCOPE:

This plan provides for the safe use, transfer, storage, and processing of flammable and combustible liquids, to include flammable aerosols. These provisions are intended to reduce the hazards to a degree consistent with reasonable public safety, without undue interference to operational convenience and necessity which require the use of flammable and combustible liquids.

II. DEFINITIONS:

AEROSOL: A material that is dispensed from its container as a mist, spray, or foam by a propellant under pressure.

FLAMMABLE AEROSOL: An aerosol that is required to be labeled "flammable" under the U.S. Federal Hazardous Substances Labeling Act.

FLASH POINT: The minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with the air near the surface of the liquid.

COMBUSTIBLE LIQUID: A liquid having a flash point at or above 100 deg F. (37.8 deg C.)

Following are examples of combustible liquids and their flash points:

Lubricating oils: 250 - 475 deg. F.

Ethylene Glycol: 232 deg F.

Carbolic Acid: 175 deg F.

Some cleaning solvents: 140 deg F.

Most oil based paints: 105 - 140 deg F.

FLAMMABLE LIQUID: A liquid having a flash point below 100 degrees F (37.8 Deg. C) and

having a vapor pressure not exceeding 40 pounds per square inch (PSI).

Following are examples of Flammable Liquids and their flash points:

Xylene:	81 deg F.
Most alcohols:	50 - 60 deg F.
Toluene:	40 deg F.
Benzene:	12 deg F.
Tetrahydrofuran:	6 deg F.
Acetone:	1.4 deg F.
Ethyl ether:	-49 deg F.

PORTABLE TANK: Any vessel of 60 U.S. gallons or less capacity used for the transport or storage of liquids .

CONTAINER: Any closed vessel having a liquid capacity over 60 U.S. gallons and not intended for fixed installation.

LIQUID PROCESSING FACILITY: A facility or area where chemical and/or physical operations take place involving the separation, purification, or change in state, energy content, or composition of chemicals.

III. **APPLICATION:**

The following are various applications, operations, and areas where flammable and combustible liquids may be used, stored, transferred, or processed.

NOTE: TO DETERMINE THE CLASSIFICATION OF A LIQUID, REFER TO THE PRODUCT LABEL AND THE MATERIAL SAFETY DATA SHEET (MSDS) FOR THE PRODUCT.

TANK STORAGE: Flammable and combustible liquids stored in above ground and underground storage tanks shall conform to the provisions of NFPA 30-2.

PIPES, VALVES AND FITTINGS: The design, fabrication, assembly, testing and inspection of piping systems containing flammable and combustible liquids shall be in conformity with NFPA 30-3 and ANSI B31 "American National Standard Code for Pressure Piping"

DESIGN, CONSTRUCTION AND CAPACITY OF STORAGE CABINETS:

Metal cabinets must be constructed of at least no. 18 gauge sheet iron, double-walled, with a one and one half inch air space and tight joints. Doors must have three point locks and the sill must be at least two inches above the bottom of the cabinet. Wooden cabinets must be constructed of at least one-inch plywood. All joints must be rabbetted and fastened two-directionally with flathead screws. Not more than 120 gallons of class I, II, and IIIA liquids

may be stored in a storage cabinet. Of this total, not more than 60 gallons may be of class I and II liquids, and not more than three (3) such cabinets may be located in a single fire area.

(EXCEPTION): In an industrial occupancy, additional cabinets may be located in the same fire area if the additional cabinets (maximum of three) are separated from other cabinets or group of cabinets by at least 100 feet.

DESIGN, CONSTRUCTION AND CAPACITY OF CONTAINERS AND PORTABLE TANKS:

Only approved containers and portable tanks that meet the requirements of NFPA 30-4, NFPA 386, or Chapter I, Title 49 of the Code of Federal Regulations (DOT) shall be used.

DESIGN, CONSTRUCTION AND OPERATION OF INSIDE STORAGE ROOMS:

Inside rooms shall be constructed to meet the requirements of NFPA 30-4-4.1.1, and NFPA 251. Except for drains, floors shall be liquid tight and the room shall be liquid tight where the walls join the floor. Openings in the interior walls to adjacent rooms or buildings shall be provided in accordance with NFPA 30-4-4.1.2. Electric wiring and equipment located in inside rooms used for class I liquids shall be suitable for Class I, Division 2 locations, and for class II and III liquids shall be suitable for general use. Design and installation shall be in conformity with NFPA 70, National Electric Code. Every inside room shall be provided with either a gravity or a continuous mechanical exhaust ventilation system in accordance with NFPA 30-4-4.1.6.

CLASS I LIQUIDS SHALL NOT BE PERMITTED IN INSIDE STORAGE ROOMS IN BASEMENT AREAS.

OFFICE, EDUCATIONAL AND INSTITUTIONAL OCCUPANCIES: Storage shall be limited to that required for the operation of office equipment, maintenance, demonstration, and laboratory work, as prescribed in NFPA 30-4-5.4.

Containers for class I liquids outside of a separate inside storage area shall not exceed a capacity of 1 gallon unless in an approved safety can, where a capacity of 2 gallons is allowed.

Not more than 10 gallons of class I and class II liquids combined shall be stored in a single fire area outside of a storage cabinet or a separate inside storage area unless in safety cans. If in safety cans, not more than 25 gallons shall be stored.

Not more than 60 gallons of class IIIA liquids shall be stored outside of a separate inside storage area or storage cabinet.

GENERAL PURPOSE WAREHOUSE: General purpose warehouses shall be separate, detached buildings or separated from other type occupancies by a standard 4 hour fire wall or if approved by the authority having jurisdiction, a fire partition having a fire resistant rating of not less than 2 hours. Warehouse operations that include the storage of flammable and combustible liquids shall conform to the requirements of NFPA 30-4-5.6 and NFPA 80 (Standard for Fire Doors and windows).

INCIDENTAL USE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS: Where the use and handling of liquids is only incidental to the principal business, the quantity of liquid that may be located outside of storage cabinets, inside storage rooms, cutoff rooms and attached buildings, general purpose warehouses, liquid warehouses or other specific processing areas that are separated by at least 2 hour fire rated separation from the general area shall not be greater than any of the following:

1. A one day operational supply or the sum of 2, 3, 4, and 5.
2. 25 gallons of class IA liquid in containers;
3. 120 gallons of class IB, IC, II, or III liquids in containers;
4. 2 portable tanks, each not exceeding 660 gallons of class IB, IC, II, IIIA liquids;
5. 20 portable tanks, each not exceeding 660 gallons of class IIIB liquids.

Areas classified under this "incidental use" section shall be continuously monitored by the safety committee through risk assessments conducted by the safety officer and the authority having jurisdiction, and through environmental and hazard surveillance rounds. Approval by the Safety Officer and the Authority Having Jurisdiction shall be required prior to the establishment of a new flammable and combustible liquid storage area, or relocating, increasing the quantity of storage, or changing the type of liquids stored in existing areas.

In accordance with NFPA 30-4-2.3.1, medicines, beverages, foodstuffs, cosmetics, and other common consumer products, when packaged according to commonly accepted practice for retail sales, shall be exempt from the provisions of NFPA 30-4-2.1, and 30-4-2.3(table 4-2.3), as the provisions relate to the design, construction and capacity of containers and the maximum allowable size of containers and portable tanks.

Medicines, Foodstuffs, cosmetics, and other consumer products containing not more than 50% by volume of water-miscible liquids and with the remainder of the solution not being flammable, and when packaged in individual containers not exceeding 1 gallon in size shall be exempt from these portions of the standard.

CONTROL OF IGNITION SOURCES: Precaution shall be taken to prevent the ignition of flammable vapors. Examples of ignition sources include:

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| a. open flames | h. frictional heat or sparks |
| b. lightning | i. static electricity |
| c. hot surfaces | j. electric sparks |
| d. radiant heat | k. stray currents |
| e. smoking | l. ovens, furnaces, and |
| f. cutting and welding | m. heating equipment |
| g. Spontaneous ignition | |

SMOKING SHALL BE AUTHORIZED ONLY IN DESIGNATED AND PROPERLY IDENTIFIED AREAS.

Welding, cutting and similar operations shall not be permitted in areas containing flammable liquids without a written permit. The permit shall be issued only after the issuing authority has inspected the area to ensure that proper precautions have been taken in accordance with NFPA 51B.

STATIC ELECTRICITY: All equipment such as tanks, machinery and piping where an ignitable mixture may be present shall be bonded or grounded as prescribed in NFPA 77.

INSPECTION AND MAINTENANCE: Fire protection equipment shall be properly maintained and periodic inspections and testing shall be conducted in accordance with standard practice and equipment manufacturers' recommendations.

Maintenance and operating practices shall control leakage and prevent spillage of flammable liquids.

Combustible waste materials and residues in operating areas shall be kept to a minimum, stored in covered metal containers, and disposed of daily.

Grounds around facilities where liquids are stored, handled or used shall be kept free of weeds, trash or other unnecessary combustible material.

Aisles established for movement of personnel shall be maintained free of obstacles to permit orderly evacuation and provide ready access for manual fire fighting activities.

EMERGENCY PLANNING AND TRAINING: An emergency response plan consistent with the available equipment and personnel shall be established to respond to fires or other emergency. The plan shall consist at a minimum, the following:

- a. Procedures to be used in case of fire.
- b. Duties and training of personnel assigned fire safety duties.
- c. Maintenance of fire protection equipment.
- d. Fire drills
- e. Shutdown or isolation of equipment to reduce the escape of liquids.
- f. Interim life safety measures to provide for the safety of occupants whenever fire protection equipment is shut down.

SPILLS AND LEAKS: Spills of flammable and combustible liquids shall be cleaned up promptly. Cleanup personnel shall use appropriate personal protective equipment. If a major spill occurs, remove all ignition sources and ventilate the area. Do not allow the liquids to enter a confined space such as a sewer, creating an explosive environment. Vapors from flammable liquids are heavier than air, and can move along the ground and will settle in low areas.

DETECTION AND ALARM: An approved means for prompt notification of fire emergency personnel potentially in danger and to the fire department shall be provided and maintained.

PORTABLE FIRE CONTROL EQUIPMENT: Listed portable fire extinguishers shall be

provided in such quantities, sizes and types as may be needed for the special hazards of operations and storage as determined by NFPA 30-5-5.1.3 and NFPA 10, Standard for Portable Fire Extinguishers.

Other portable fire control equipment may be required, as indicated by NFPA 30-5-5.6.

FIXED FIRE CONTROL EQUIPMENT: A reliable water supply or other suitable fire control agent shall be available in pressure and quantity to meet the fire demands indicated by the special hazards of operation, storage or exposure as determined by NFPA 30-5-5.1.3.

Other equipment may be required as referenced in NFPA 30-5-5.7.

Approved:

This plan was approved by the CMO and CEO in April 2008.