FUEL STORAGE and HAZARDOUS MATERIAL STORAGE - Reminder List

Applicable Codes and Standards
CFC 2010, NFPA 30 - 2008, NFPA 704 - 2007  Date: 8/2/11

Instructions: The following items are to be verified for completeness prior to submitting to OSHPD for plan review.

Scope: This list is relative to the storage of flammable & combustible liquids.

chk N/A I. General Requirements Hazardous Material Storage
1. Determine Maximum Allowable Quantities (MAQ) per control area. CFC 2703.1, 2703.1.1
2. Evaluate quantities not exceeding the MAQ per control area
3. Evaluate quantities exceeding the MAQ per control area.
4. Evaluate design & construction of containers, cylinders, tanks, piping, fittings, tubing, valving,
5. Manual or automatic emergency safety shut-off valves at supply piping at the point of use and tank, cylinder, or bulk
6. Underground tanks - secondary containment required. (or use vault CFC 3404.2.8)
7. Aboveground tanks - in accordance to outdoor storage Chapter 34. (If vaults see 3003.16, 3404.2.8)
8. Sources of ignition, "no smoking", "no open flames" - signs provided
9. Liquid-level limit control required - Atmospheric tanks greater than 500 gallons.
10. Seismic protection required.
11. Control areas are to be separated from each other by fire barriers, floor assemblies, supporting members. Note CFC 2703.8.3.4 exceptions based on construction, number of stories, and sprinkler protection.
12. Percentage of MAQ of hazardous materials, flammable, combustible, oxidizers per control area per floor within a Table 2703.8.3.2 building in accordance to CFC.
13. Maximum number of control areas per floor in a building calculated correctly.
14. Hazardous materials storage cabinets used to increase MAQ per control area, properly constructed or listed per UL CFC 2703.8.7.1, 8.7.2
15. Protection from vehicles for storage tanks, piping, valves, and fittings subject to vehicle damage.
16. Outdoor control areas not exceeding MAQ arranged per CFC.
17. Handling and transportation of small quantities of hazardous materials/liquids in corridors, elevators or exit enclosures per CFC?
18. Elevators used to transport hazardous materials/liquids per carts/containers.

chk N/A II. Tank Storage - Flammable & Combustible Liquids
1. Tank construction /Design standards for above and below ground tanks.
2. Pressure limitations for tanks.
3. Tank vents for normal venting - piping used only for venting.
4. Vent piping design, size, constructed, & installed.
5. Vent line flame arresters provided? Use in accordance with API 2028
6. Vent pipe outlets for Class I,II,IIIA liquids vents to safe location 12 feet above finished ground level.
7. Vent outlets not trapped by eves or construction & 5 feet from building openings.
8. Class IIIb liquids may vent inside buildings if normally closed. Connected to equipment vent outside.
9. Vent piping - protection from vehicle damage provided?
10. Flexible joints installed.
11. Manifolding vent pipes - Above-ground tanks? - sized for correct pressure limits
12. Manifolding vent pipes - Below-ground tanks? - sized for correct pressure limits
13. Vent Manifolding with Class I liquids not permitted with Class II, III liquids.
14. Emergency venting provided - stationary above-ground tanks? See exception for tanks over 12,000 gallons.
15. Filling, emptying and vapor recovery openings shall be outside buildings 5 ft. above grade, 5 ft. from lot lines & building openings. Class I,II,IIIA liquids connected to fuel burning equipment shall be located at grade outside buildings.
16. Piping, connections and fittings.
17. Overfill protection provided?

chk N/A III. Vaults - Above & Below Ground
1. Listed in accordance with UL 2245 or built per the CBC (special inspections for seismic strength required).
2. Above ground tanks permitted to be installed in vaults.
3. Design and construction - vault completely enclose tank. Access openings for inspection only
4. Secondary containment required.
5. Internal clearance between vault and tank provided?
6. Anchoring of vaults and their tanks.
7. Vehicle impact protection. (above ground)
8. Tank listed for above ground use and be in it's own vault. NFPA 30, 25.3.1.5
9. Vault ventilation provided?
10. Liquid detection provided
11. Monitoring and detection
12. Vent pipes for normal venting terminate 12 ft. above grade.
13. Emergency vents provided?
14. Access way provided in vault?
15. Means to admit a fire suppression agent.
16. Overfill protection provided?
IV. Access way provided in vault?

1. Fire protection of tank supports - For Class I, II, IIIA > 12 inches in height requires fire protection rating of 2 hours.  
   CFC 3404.29.2.3

2. Above-ground tanks inside buildings - Class I, II, IIIA liquids require a means of overflow protection.  
   CFC 3404.29.5

3. Tanks containing Class III B liquids & connected to fuel-burning equipment require a means of overflow protection.  
   CFC 3404.29.5

4. Above-ground tanks outside buildings - location tanks 2.5 psig or less, Class I, II, IIIA liquids located per Table 22.4.1.1(a), NFPA 30
   NFPA 30, CFC 3404.2.9.6.1.1

4a. Protected above-ground tanks at-grade or above-grade vaults (per 3404.2.8), distances in Table 22.4.1.1(b) can be reduced 1/2 but not less than 5 feet.

5. Above-ground tanks outside buildings, Class I, II, IIIA liquids exceeding 2.5 psig or with emergency venting pressures exceeding 2.5 psig shall be located per Table 22.4.1.3(a), NFPA 30
   CFC 3404.2.9.6.1.2, NFPA 30

6. Location of above-ground tanks storing Class III B liquid - located per Table 22.4.1.6, NFPA 30. When located in a diked or drainage path of tanks(Class I, II Liq.) distances per 3404.2.9.6.1.1 apply.
   CFC 3404.2.9.6.1.5

7. Separation between adjacent tanks with flammable and combustible liquids and LP-gas is 20 feet. (See exceptions)  
   CFC 3404.2.9.6.3

★ Atmospheric above-ground tanks with secondary containment.

V. ADDITIONAL REQUIREMENTS - PROTECTED-ABOVE GROUND TANKS

1. Construction of tanks per CFC 3404.2.7.
   CFC 3404.2.9.7

2. Normal and emergency venting required. (3404.2.7.3 & 3404.2.7.4)  
   CFC 3404.2.9.7.2

3. Flame arresters required or pressure vacuum breather valves shall be installed in normal vents.  
   CFC 3404.2.9.7.3

4. Above ground tanks are to have secondary containment, drainage, control, or diking.  
   CFC 3404.2.9.7.4, 2704.2, NFPA

5. Vehicle impact protection.  
   CFC 3404.2.9.7.5

6. Overfill prevention system.  
   CFC 3404.2.9.7.6

   CFC 3404.2.9.7.6

8. Fill pipe connections  
   CFC 3404.2.9.7.7

   CFC 3404.2.9.7.8

10. Tank openings through the top only.  
    CFC 3404.2.9.7.9

11. Antisiphon device provided?  
    CFC 3404.2.9.7.10

12. Drainage and diking provided? (not required for listed secondary containment tanks)  
    CFC 3404.2.10

VI. UNDER-GROUND TANKS

1. Distance from nearest basement wall, pit, cellar, or lot line shall not be less than 3 feet.  
   CFC 3404.2.11.2

2. Minimum distance of 1 foot shell to shell between underground tanks.  
   CFC 3404.2.11.2

3. Depth and cover - 6 inches of inert material. Traffic areas - 36 inches (see tank manufacturers instructions) NFPA 30, 23.5.2.2
   NFPA 30, 23.5.2.2

   NFPA 30, 23.5.3.1

5. Leak detection required.  
   NFPA 30, 23.5.3.1

6. Tank venting systems to prevent blowback of vapor/liquid during filling.  
   NFPA 30, 23.6.1

7. Vent piping sized in accordance with Table 23.6.2  
   NFPA 30, 23.6.2

8. Fill and discharge lines enter through the top?  
   NFPA 30, 23.13.3

9. Filling, emptying, and vapor recovery openings shall be located outside 5 feet from building openings.  
   NFPA 30, 23.13.6

NOTE
Compliance with all items on this list does not necessarily assure compliance with all provisions of the applicable codes and standards. This check list should be used only by persons with a comprehensive knowledge of the applicable codes and standards. This list is for OSHPD personnel only and shall not be distributed to the public.

http://www.oshpd-state.ca.us/fdd/Regulation/index.htm

OSHPD Project Review Status
http://www.oshpd-state.ca.us/logbook/search1.asp

OSHPD Public Use Forms
http://www.oshpd-state.ca.us/fdd/Resources/forms/index.htm