2016 Aboveground #2 Fuel Oil Storage Reminder List

Applicable Codes and Standards
NFPA 704 2012

I. Scope

1. Emergency power systems and standby power systems required by this code or the California Fire Code shall be installed in accordance with this code and the California Fire Code, NFPA 70 and NFPA 110.

2. Prevention, control and mitigation of dangerous conditions related to storage, use, dispensing, mixing and handling of flammable and combustible liquids shall be in accordance with California Fire Code Chapter 50 and Chapter 57.

3. Flammable and combustible liquids shall not be placed, stored or handled in any occupancy within the scope of California Code of Regulations, Title 19, Division 1 regulations, except as provided in the California Fire Code.

II. Generator Fuel Supply

1. Minimum fuel supply of 24 hrs. for acute care hospital. (Min 72 hrs. for NPC-5) CEC 700-

2. Minimum fuel supply of 6 hrs. for SNF, Psych, ICF.


4. Minimum fuel supply of 96 hours in seismic design category C, D, E or F as determined in accordance with ASCE 7. Not a CBC requirement. Required for CDPH, CMS and TJC approvals.

5. Liquid fuel shall feed to engines by pumps only.

6. Fuel supply for exclusive use of EPSS or separate draw down.

7. Main fuel tank(s) shall be sized to accommodate 133% of the specific EPS class.

8. Low-fuel sensing switch required for the main fuel supply tank(s) when less than the minimum fuel required for the specific EPS class remains in the tank(s).

9. Calculate generator fuel consumption.

10. Tanks shall be sized so that the fuel is consumed within the storage life, or provisions shall be made to remediate fuel that is stale or contaminated or to replace stale or contaminated fuel with clean fuel.

11. Prior to being placed into service, tanks shall be tested in accordance with Section 21.5 of NFPA 30.

12. Low fuel annunciation at generator panel.

13. Low fuel annunciation at a remote location on-site or off-site.

14. Low fuel annunciation at a constantly monitored location.

15. Low fuel annunciation at regular work station of operating personnel.

III. Aboveground Tanks Located Outside of Buildings

1. Location approved by local authorities.

2. Tank location distance to property lines, public ways and important buildings shall be in accordance NFPA 30, Table 22.4.1.1(a).

3. Tank, tank vent and tank filler locations in accordance with NFPA 55, Table 9.3.2.
4. Signage in accordance with NFPA 704 >100 gal. capacity.  CFC, Sec. 504.2.3.2

5. Fabrication & construction of tanks complies with NFPA 30. See NFPA 30, Sections 21.4.1 & 21.4.2.  CFC, Sec. 504.2.7

6. Horizontal cylindrical and rectangular tanks shall not exceed a gauge pressure of 1 psi and shall be limited to 2.5 psi under emergency venting conditions.  NFPA 30, Sec. 21.4.2.1.4

7. The design of the supporting structure for tanks shall be in accordance with the California Building Code and NFPA 30.  CFC, Sec. 504.2.7.7

8. Where a tank is located in an area where it is subject to buoyancy because of a rise in the water table, flooding or accumulation of water from fire suppression operations, uplift protection shall be provided in accordance with Sections 22.14 and 23.14 of NFPA 30.  CFC, Sec. 504.2.7.8

9. Supports or pilings for above-ground tanks storing Class I, II or IIIA liquids elevated more than 12 inches above grade shall have a fire-resistance rating of not less than 2 hours in accordance with the fire exposure criteria specified in ASTM E 1529 or protected in accordance with UL2085 for protected tanks or protected by an approved water spray system designed in accordance with Chapter 9 and NFPA 15.  CFC, Sec. 504.2.9.2.3

10. Guard posts or other means shall be provided to protect exterior storage tanks from vehicular damage.  CFC, Sec. 504.4.5

11. Spill control required when any individual vessel exceeds 55 gal. or the aggregate capacity exceeds 1,000 gals.  CFC, Sec. 5004.2.1

12. Secondary containment required when maximum allowable quantity exceeds provisions of CFC Table 5003.1.1(1).  CFC, Sec. 5004.2.1

13. Listed generator subbase secondary containment fuel tanks of (660 gal) capacity and below shall be permitted to be installed outdoors or indoors without diking or remote impounding.  NFPA 110, Sec. 7.9.12

14. Drainage control or diking required for aboveground tanks located outside.  CFC, Sec. 504.2.10

15. Drainage control or diking not required for listed secondary containment aboveground tanks located outside.  CFC, Sec. 504.2.10, Exc. 2

16. Fuel tanks supplied by pumps shall have (1) overflow line piped to source tank, (2) high level alarm and (3) high-level automatic shutoff.  NFPA 37, Sec. 6.5.4

17. Filling, emptying and vapor recovery connections shall be located outside no less than 5' from building openings or lot lines of property that can be built on.  CFC, Sec. 504.2.7.5.2

IV. Aboveground Tanks Located Inside Buildings

1. Signs prohibiting open flames and smoking.  CFC, Sec. 504.2.3.1

2. Signage in accordance with NFPA 704 >100 gal. capacity.  CFC, Sec. 504.2.3.2

3. Liquid storage room/warehouse required when maximum allowable quantity exceeded.  CFC, Sec. 504.3.4.3

4. Liquid storage room (H-3) >1000 sq. ft. must have at least 25% of perimeter on an exterior wall.  CBC, Sec. 415.6

5. Liquid storage room must be separated from adjacent occupancies as required for H-3 occupancies.  CBC, Sec. 508.4.4

6. The design of the supporting structure for tanks shall be in accordance with the California Building Code and NFPA 30.  CFC, Sec. 504.2.7.7

7. Tanks inside buildings required to have means to prevent overflow into the building.  CFC, Sec. 504.2.9.5.1

8. Fabrication & construction of tanks complies with NFPA 30. See NFPA 30, Sections 21.4.1 & 21.4.2  CFC, Sec. 504.2.7

9. Horizontal cylindrical and rectangular tanks shall not exceed a gauge pressure of 1 psi and shall be limited to 2.5 psi under emergency venting conditions.  NFPA 30, Sec. 21.4.2.1.4

10. Spill control required when any individual vessel exceeds 55 gal. or the aggregate capacity exceeds 1,000 gals.  CFC, Sec. 5004.2.1

11. Secondary containment required when maximum allowable quantity exceeds provisions of CFC Table 5003.1.1(1).  CFC, Sec. 503.4
12. Listed generator subbase secondary containment fuel tanks of (660 gal) capacity and below shall be permitted to be installed outdoors or indoors without diking or remote impounding.

13. Monitoring of secondary containment of tanks located indoors required.

14. Shall not be located near or be allowed to obstruct an the egress route.

15. Sprinkler protection required when maximum allowable quantity is exceeded (120 gal for Class II).

16. Protected by fire sprinklers if Group H-3.

17. Spill control and secondary containment when tank located inside structure or on roof of structure.

18. Fuel tanks supplied by pumps shall have (1) overflow line piped to source tank, (2) high level alarm and (3) high-level automatic shutoff.

19. Filling, emptying and vapor recovery connections shall be located outside no less than 5' from building openings or lot lines of property that can be built on.

V. Additional Requirements for Protected Aboveground Tanks

1. Emergency vents on protected tanks are permitted to discharge in a building.

2. Structural supports tested as part of a protected tank in accordance with UL2085, require no additional fire-resistance rating.

3. Protected tank location distances to property lines, public ways and important buildings of NFPA 30, Table 22.4.1.1(b) are permitted to be reduced by 1/2 but not less than 5 ft.

4. Normal vents on protected tanks require flame arrestors or pressure vacuum breather valves.

5. Protected tanks require secondary containment, drainage control or diking in accordance with CFC, Sec. 5004.2

6. A means shall be provided to establish the integrity of second containment in accordance with NFPA 30.

7. Vehicle impact protection is required, either incorporated into the system or by guard posts, or both.

8. Protected aboveground tanks shall be provided with overfill prevention.

9. Tank openings in protected tanks shall be on the top only.

10. Antisiphon devices required on all piping extending below the top level of the tank.

VI. Additional Requirements for Aboveground Vaults

1. Listed in accordance with UL 2245.

2. Vault location distances to property lines, public ways and important buildings of NFPA 30, Table 22.4.1.1(b) are permitted to be reduced by 1/2 but not less than 5 ft.

3. Listed aboveground tanks permitted to be installed in vaults.

4. Tank completely enclosed within vault. No openings except those necessary for access, inspection, filling, emptying and venting.

5. Vaults shall be substantially liquid tight.

6. Sufficient clearance between tank and vault to allow for inspection and maintenance.

7. Anchored to prevent uplifting by flooding.
8. Shall be resistant to damage from motor vehicle impact or protected by guard posts.  
   CFC, Sec. 5704.2.8.6

9. Connections provided for ventilating vault.  
   CFC, Sec. 5704.2.8.8

10. Liquid (including water) detection system and alarm required.  
    CFC, Sec. 5704.2.8.10

11. Vapor and liquid detection system with audible and visual alarms.  
    CFC, Sec. 5704.2.8.11

12. Means provided to remove liquid from vault.  
    CFC, Sec. 5704.2.8.12

13. Normal vents shall terminate at least 12 ft. above ground level.  
    CFC, Sec. 5704.2.8.13

14. Emergency vents shall be permitted to discharge inside vault.  
    CFC, Sec. 5704.2.8.14

15. Accessway provided.  
    CFC, Sec. 5704.2.8.15

16. Means provided to admit fire suppression agent.  
    CFC, Sec. 5704.2.8.16

17. Overfill protection provided in accordance with CFC, Section 5704.2.9.7.6.  
    CFC, Sec. 5704.2.8.18

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VII. Generator Fuel Supply/Return Piping

1. Provisions shall be made for pressure testing of piping.  
   CFC, Sec. 5703.6.3

2. Protected from corrosion and galvanic action.  
   CFC, Sec. 5703.6.5

3. Piping protected from vehicle damage by guard posts or other approved means.  
   CFC, Sec. 5703.6.4

4. Supports protected by 2-hr fire rating, draining or other approved means.  
   CFC, Sec. 5703.6.8

5. Approved metallic or nonmetallic flex connectors permitted to protect the piping.  
   NFPA 37, Sec. 6.8.2.1

6. Valves shall be provided to control normal flow and shut off flow for breaks.  
   NFPA 37, Sec. 6.8.3

7. Fuel piping shall be of compatible metal to minimize electrolysis and be properly sized.  
   NFPA 110, Sec. 7.9.3

8. Galvanized fuel lines shall not be used.  
   NFPA 110, Sec. 7.9.3.1

9. Approved flexible fuel lines shall be used between the prime mover and the fuel piping.  
   NFPA 110, Sec. 7.9.3.2

10. Fuel line solenoids shall be battery powered.  
    NFPA 110, Sec. 7.9.9
    & Sec. 5.6.3.2

11. EPS piping shall be designed to minimize damage from earthquakes.  
    NFPA 110, Sec. 7.11.5

12. Gravity return fuel lines between the day tank and main supply tank shall flow freely to the main tank.  
    NFPA 110, Sec. 7.9.4.2

13. Gravity feed to generator not permitted.  
    NFPA 37, Sec. 6.5.1

14. Spill control, drainage control & secondary containment not required for piping connected to systems. See ANSI/ASME B31.3

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VIII. Aboveground Tank Venting

1. Vents for normal venting shall vent to exterior not less than 12 ft. above ground level and not less than 5' from openings or lot lines of property that can be built on.  
   CFC, Sec. 5704.2.7.3.3

2. The vent pipe shall terminate outside the building at a point at least 24 in. from any building opening at the same or lower level.  
   NFPA 37, Sec. 6.7.1.1

3. Piping for normal venting shall discharge vertically or horizontally and shall not be trapped by eaves or other obstructions.  
   CFC, Sec. 5704.2.7.3.3

4. Piping for normal venting shall drain back to tank.  
   CFC, Sec. 5704.2.7.3.4
5. Vent piping shall not be manifolded unless otherwise required.  

6. Normal vent line piping not used for any other purpose.  

7. Vent piping protected from vehicle damage by guard posts or other approved means.  

8. Aboveground tanks require additional emergency venting.  


**IX. Temporary Installations**

1. During construction, temporary aboveground storage tanks shall be in accordance with the provisions of CFC Sec. 5706.2.1 through 5706.2.8.1

**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.


- OSHPD Project Review Status  
  [http://www.oshpd.ca.gov/FDD/project_status/index.asp](http://www.oshpd.ca.gov/FDD/project_status/index.asp)

- OSHPD Public Use Forms  
  [http://www.oshpd.ca.gov/FDD/Forms/index.html](http://www.oshpd.ca.gov/FDD/Forms/index.html)