2019 Aboveground #2 Fuel Oil Storage Reminder List

Applicable Codes and Standards
CBC 2019, CEC 2019, CMC 2019, CFC 2019

I. Scope
1. Emergency and standby power systems required by the California Building Code or the California Fire Code shall be installed in accordance with the California Building 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, Chapter 57 and Sec. 603.3.

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.

CBC, Sec. 2707.1.3
CFC Sec. 5701.1
CCR, Title 19, Div. 1, Sec. 3.15

II. Generator Fuel Supply
1. Minimum fuel supply of 24 hrs. full-demand operation for acute care hospital. (Min 72 hrs. for NPC-5)

2. Minimum fuel supply of 6 hrs. full-demand operation 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. This is not a CBC requirement. However, it may be required for CDPH, CMS or JCI approval.

5. See OSHPD CAN 2-108 for temporary generator fuel supplies.

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

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

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

9. 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).

10. Calculate full-demand generator fuel consumption.

11. 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.

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

13. Low fuel annunciation at generator panel.

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

15. Low fuel annunciation at a constantly monitored location.

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

CEC 700-12(B)(2) Exc. 1
CEC 700-12(B)(2) Exc. 2
CEC 700-12(B)(2) Exc. 3
NFPA 110-2010, Sec. 5.1.2
NFPA 99, Sec. 6.7.1.2.15
NFPA 110, Sec. 5.5.1 
& Sec. 5.5.1.1
NFPA 110, Sec. 5.5.2
NFPA 110, Sec. 7.9.1
NFPA 110, Sec. 7.9.1.3
NFPA 31, Sec. 7.2.3
NFPA 110, Sec. 5.6.5.1
NFPA 110, Sec. 5.6.6.2(1)
NFPA 110, Sec. 5.6.1.1
NFPA 99, Sec. 6.7.1.2.15, 6.7.1.2.15.2
NFPA 99, Sec. 6.7.1.2.15, 6.7.1.2.15.2
CAC, Sec. 7-125 (b)
CFC, Sec. 603.3.1, NFPA 31, Sec. 7.8.3

III. Aboveground Tanks Located Outside of Buildings
1. Location approved by local authorities when applicable.

2. Location of tanks with a capacity >660 gals. distance to property lines, public ways and important buildings shall be in accordance NFPA 30, Table 22.4.1.1(a).

CAC, Sec. 7-125 (b)
CFC, Sec. 603.3.1, NFPA 31, Sec. 7.8.3
III. Aboveground Tanks Located Outside of Buildings Continued

3. Tank, tank vent and tank filler locations in accordance with NFPA 55, Table 9.3.2.
   - NFPA 55, Sec. 9.3.2
4. Signage in accordance with NFPA 704.
   - NFPA 30, Sec. 21.7.2.1
5. Fabrication & construction of tanks complies with NFPA 30, Chapters 21, 22 & 23.
   - NFPA 31, Sec. 7.2.3
6. Tanks of 1320 gal. capacity or less in compliance with UL 80, UL 142, UL 2080, UL 2085 or SU 2258.
   - NFPA 31, Sec. 7.2.7.4
7. Tanks of greater than 1320 gal. capacity in compliance with UL 80, UL 142, UL 2080 or UL 2085.
   - NFPA 31, Sec. 7.2.7.5
8. 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.
9. Tanks and their supports rest on a foundation of solid concrete. Foundation designed to minimize uneven settling and to minimize corrosion of tank.
   - NFPA 31, Secs. 7.3.1 & 7.3.2
10. In areas subject to earthquake, tank supports and connections shall be designed to resist damage as a result of such shocks.
    - NFPA 31, Sec. 7.2.8.1
11. 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.
12. Steel supports 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.
13. Tank capable of resisting vehicle impact damage or collision barriers required.
    - NFPA 30, Sec. 22.15
14. Spill control required when any individual vessel exceeds 55 gal. or the aggregate capacity exceeds 1,000 gals. and secondary containment is not provided.
    - CFC, Sec. 603.3.2.6
15. 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
16. Drainage control or diking required for aboveground tanks located outside.
    - NFPA 30, Sec. 22.11
17. Drainage control or diking not required for listed secondary containment aboveground tanks located outside.
    - NFPA 30, Sec. 22.11.4
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.
    - NFPA 37, Sec. 6.5.4
19. Filling, emptying and vapor recovery connections shall be located outside no less than 5' from building openings.
    - NFPA 30, Sec. 22.13.4.1
20. The minimum horizontal separation between an LP-gas container >125 gals. and a Class I, II or IIIA liquid storage tank >660 gals. shall be 20 feet.

IV. Aboveground Tanks Located Inside Buildings

1. Signs prohibiting open flames and smoking.
   - CFC, Sec. 308.1.1 & 310.2
   - CFC, 5704.2.3.2, NFPA 30, Sec. 21.7.2.1
2. Signage in accordance with NFPA 704 >100 gal. capacity.
3. In unsprinklered buildings, tanks shall comply with UL 80, UL 142 or UL 2085. The aggregate capacity of all tanks shall not exceed 660 gals.
   - CFC, Sec. 603.3.2.1, Item 1
4. In sprinklered buildings, the aggregate capacity of tanks that comply with UL 142 shall not exceed 1320 gals.
   - CFC, Sec. 603.3.2.1, Item 2
5. In sprinklered rooms, the aggregate capacity of protected tanks that comply with UL 2085 and CFC Sec. 5704.2.9.7 shall not exceed 3000 gals.
   - CFC, Sec. 603.3.2.1, Item 3
IV. Aboveground Tanks Located Inside Buildings Continued

6. ≤ 3000 gals. of combustible liquids stored in accordance with Sec. 603.3.2.1 in compliant tanks shall not be counted towards the maximum allowable quantity. Such tanks are not required to be located in a control area.


8. Group H-3 occupancy >1000 sq. ft. must have at least 25% of perimeter on an exterior wall.

9. Group H-3 occupancy separated from adjacent occupancies in accordance with CBC Table 508.4. See Sec 442 for a room containing a generator.

10. The design of the supporting structure for tanks shall be in accordance with the California Building Code and NFPA 30.


12. Tanks inside buildings required to have means to prevent overflow into the building.

13. Room containing tank requires a minimum 1-hour separation. See CBC Table 508.4 and Sec.442 for a room containing a generator.

14. Tanks in basements located not more than two stories below grade plane.

15. Tanks exceeding 60 gal. capacity installed on lowest floor (story, cellar or basement).

16. Spill control required when any individual vessel exceeds 55 gal. or the aggregate capacity exceeds 1,000 gals and secondary containment is not provided.

17. 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.

18. 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.

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

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

21. Any size tank permitted in a mechanical room when detection, suppression and containment means are provided.

22. Auxiliary tank not to exceed 60 gal. capacity.

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

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

25. 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 tanks with a capacity >660 gal. location distances to property lines, public ways and important buildings in accordance with NFPA 30, Table 22.4.1.1(b) are permitted to be reduced by 1/2 but not less than 5 ft.

4. Protected tanks require secondary containment, drainage control or diking in accordance with CFC, Sec. 5004.2
V. Additional Requirements for Protected Aboveground Tanks Continued

5. A means shall be provided to establish the integrity of secondary containment in accordance with NFPA 30.  
   CFC, Sec. 5704.2.9.7.3,  
   NFPA 30, Sec. 22.11.4.9

6. Vehicle impact protection is required, either incorporated into the system or by guard posts, or both.  
   CFC, Sec. 5704.2.9.7.4,  
   NFPA 30, Sec. 22.15

7. Protected aboveground tanks shall be provided with overfill prevention.  
   CFC, Sec. 5704.2.9.7.5,  
   NFPA 30, Sec. 22.11.4.5

8. Tank openings in protected tanks shall be on the top only.  
   CFC, Sec. 5704.2.9.7.8,  
   NFPA 30, Sec. 22.11.4.2

9. Antisiphon devices required on all piping extending below the top level of the tank.  
   CFC, Sec. 5704.2.9.7.9,  
   NFPA 30, Sec. 2.11.4.3

VI. Generator Fuel Supply/Return Piping

1. Provisions shall be made for pressure testing of piping.  
   NFPA 30, Sec. 27.7

2. Protected from corrosion and galvanic action.  
   NFPA 30, Sec. 27.6.4

3. Piping protected from damage by guard posts or other approved means.  
   NFPA 30, Sec. 27.6.1

4. Supports protected by 2-hr fire rating, draining away or other approved means.  
   NFPA 30, Sec. 27.6.2

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. 5.6.3.2.1

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 exposed piping connected to systems. See ANSI/ASME B31.3

VII. Aboveground Tank Venting

1. 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

2. Piping for venting shall discharge upward or horizontally away from adjacent walls.  
   NFPA 30, Sec. 27.8.1.2

3. Vent outlets shall be located so that vapors will not be trapped by eaves or other obstructions  
   NFPA 30, Sec. 27.8.1.3

4. Vent piping shall not be manifolded except where required for special purposes such as vapor recovery, vapor conservation or air pollution control.  
   NFPA 30, Sec. 27.8.1.4

5. Vent piping protected from damage by guard posts or other approved means.  
   NFPA 30, Sec. 27.6.1

VIII. Temporary Installations at Construction Sites

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.  
   CFC, Sec. 5706.2
NOTE

Compliance with all items on this list does not necessarily assure compliance with all provisions of the applicable codes and standards. This reminder list should be used only by persons with a comprehensive knowledge of the applicable codes and standards.

https://oshpd.ca.gov/construction-finance/codes-and-regulations/#cans-pins-faqs

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