

2007 Aboveground #2 Fuel Oil Storage Reminder List

Applicable Codes and Standards

CBC 2007, CEC 2007, CMC 2007, CFC 2007
 NFPA 30 2003, NFPA 37 2002, NFPA 110 2005, NFPA 55 2005

I. Scope

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| 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 and NFPA 110. | CBC, Sec. 2702.1 |
| 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 27 and Chapter 34. | CFC Sec. 3401.1 |
| 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. | CCR, Title 19, Div. 1, Sec. 3.15 |

CHK **N/A**

I. Generator Fuel Supply

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|--------------------------|--------------------------|--|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Minimum fuel supply of 24 hrs. for acute care hospital. (Min 72 hrs. for NPC-5) | CEC 700-12(B)(2)Exc.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Minimum fuel supply of 6 hrs. for SNF, Psych, ICF. | CEC 700-12(B)(2)Exc.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Minimum fuel supply of 4 hrs. for ambulatory surgery clinics. | CEC 700-12(B)(2)Exc.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. <i>Minimum fuel supply of 96 hours in seismic risk areas designated as zones 3 and 4 of the Uniform Building Code. Not a CBC requirement. Required for CDPH, CMS and TJC approvals.</i> | <i>NFPA 110-1999,
Sec. 3-1.2</i> |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Liquid fuel shall feed to engines by pumps only. | NFPA 37, Sec. 6.9 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Fuel supply for exclusive use of EPSS or separate draw down. | NFPA 110, Sec. 5.5.1
& Sec. 5.5.1.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Main fuel tank(s) shall be sized to accommodate 133% of the specific EPS class. | NFPA 110, Sec. 5.5.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 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). | NFPA 110, Sec. 5.5.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Calculate generator fuel consumption. | NFPA 110, Sec. 7.9.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Tanks shall be sized so that the fuel is consumed within the storage life, or provision shall be made to replace stale fuel with clean fuel. | NFPA 110, Sec. 7.9.1.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Prior to being placed into service, tanks shall be tested in accordance with Section 4.4 of NFPA 30. | CFC, Sec. 3404.2.12.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Low fuel annunciation at generator panel. | NFPA 110, Sec. 5.6.5.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Low fuel alarm annunciation at work site observable by personnel. | NFPA 110, Sec. 5.6.6 |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. <i>Low fuel annunciation at a constantly monitored location. Not a CBC requirement. Required for CDPH, CMS and TJC approvals.</i> | <i>NFPA 99 - 1999,
Sec. 3-4.1.1.15</i> |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. <i>Low fuel annunciation at regular work station of operating personnel. Not a CBC requirement. Required for CDPH, CMS and TJC approvals.</i> | <i>NFPA 99 - 1999,
Sec. 3-4.1.1.15</i> |

CHK **N/A**

II. Tanks Located Outside of Buildings

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|--------------------------|--------------------------|--|---------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Location approved by local authorities. | CFC, Sec. 3404.2.9.5.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Tank location distance to property lines, public ways and important buildings shall be in accordance NFPA 30, Table 4.3.2.1.1(a). | CFC, Sec. 3404.2.9.5.1.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Tank, tank vent and tank filler locations in accordance with NFPA 55, Table 9.3.2. | NFPA 55, Sec. 9.3.2 |

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| <input type="checkbox"/> | <input type="checkbox"/> | 4 Signs prohibiting open flames and smoking. | CFC, Sec. 3404.2.3.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Signage in accordance with NFPA 704 >100 gal. capacity. | CFC, Sec. 3404.2.3.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Fabrication & construction of tanks complies with NFPA 30. See NFPA 30, Sections 4.2 & 4.2.3. | CFC, Sec. 3404.2.7 |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Horizontal cylindrical and rectangular tanks shall not exceed a gauge pressure of 1 psi and shall be limited to 2.5 psi under emergency conditions. | NFPA 30, Sec. 4.2.3.1.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. The design of the supporting structure for tanks shall be in accordance with the California Building Code and NFPA 30. | CFC, Sec. 3404.2.7.7 |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. 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 4.3.2.6 and 4.3.3.5 of NFPA 30. | CFC, Sec. 3404.2.7.8 |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. 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 a water spray system in accordance with NFPA 15. | CFC, Sec. 3404.2.9.1.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Guard posts or other means shall be provided to protect exterior storage tanks. from vehicular damage. | CFC, Sec. 3404.4.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Spill control required when any individual vessel exceeds 55 gal. or the aggregate capacity exceeds 1,000 gals. | CFC, Sec. 2704.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Secondary containment required when maximum allowable quantity exceeds provisions of CFC Table 5003.1.1(1). | CFC, Sec. 3403.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. 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 |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Drainage control or diking required for aboveground tanks located outside. | CFC, Sec. 3404.2.10 |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Drainage control or diking not required for listed secondary containment aboveground tanks located outside. | CFC, Sec. 3404.2.10, Exc. 2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 17. 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 |
| <input type="checkbox"/> | <input type="checkbox"/> | 18. 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. 3404.2.7.5.2 |

CHK N/A III. Tanks Located Inside Buildings

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|--------------------------|--------------------------|---|--------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Signs prohibiting open flames and smoking. | CFC, Sec. 3404.2.3.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Signage in accordance with NFPA 704 >100 gal. capacity. | CFC, Sec. 3404.2.3.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Liquid storage room/warehouse required when maximum allowable quantity exceeded. | CFC, Sec. 3404.3.4.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Liquid storage room (H-3) >1000 sq. ft. must have at least 25% of perimeter on an exterior wall. | CBC, Sec. 415.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Liquid storage room must be separated from adjacent occupancies as required for H-3 occupancies. | CBC, Sec. 508.4.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. The design of the supporting structure for tanks shall be in accordance with the California Building Code and NFPA 30. | CFC, Sec. 3404.2.7.7 |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Tanks inside buildings required to have means to prevent overflow into the building. | CFC, Sec. 3404.2.9.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Fabrication & construction of tanks complies with NFPA 30. See NFPA 30, Sections 4.2 & 4.2.3. | CFC, Sec. 3404.2.7 |
| <input type="checkbox"/> | <input type="checkbox"/> | 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 conditions. | NFPA 30, Sec. 4.2.3.1.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Spill control required when any individual vessel exceeds 55 gal. or the aggregate capacity exceeds 1,000 gals. | CFC, Sec. 2704.2 |

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| <input type="checkbox"/> | <input type="checkbox"/> | 11. Secondary containment required when maximum allowable quantity exceeds provisions of CFC Table 2703.1.1(1). | CFC, Sec. 3403.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 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. | NFPA 110, Sec. 7.9.12 |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Monitoring of secondary containment of tanks located indoors required. | CFC, Sec. 2704.2.2.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Shall not be located near or be allowed to obstruct an the egress route. | CFC, Sec. 3404.3.3.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Sprinkler protection required when maximum allowable quantity is exceeded (120 gal for Class II). | CFC, Sec. 3404.3.7.5.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Protected by fire sprinklers if Group H-3. | CFC, Sec. 3405.3.7.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 17. Spill control and secondary containment when tank located inside structure or on roof of structure. | NFPA 37, Sec. 6.3.2.4 & Sec. 6.3.4.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 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 |
| <input type="checkbox"/> | <input type="checkbox"/> | 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. | CFC, Sec. 3404.2.7.5.2 |

CHK N/A IV. Additional Requirements for Protected Aboveground Tanks

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| <input type="checkbox"/> | <input type="checkbox"/> | 1. Structural supports tested as part of a protected tank require no additional fire-resistance rating. | CFC, Sec. 3404.2.9.1.3, Exc. 1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Protected tank location distances to property lines, public ways and important buildings of NFPA 30, Table 4.3.2.1.1(b) are permitted to be reduced by 1/2 but not less than 5 ft. | CFC, Sec. 3404.2.9.5.1.1, Exc. 3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Normal vents on protected tanks require flame arrestors or pressure vacuum breather valves. | CFC, Sec. 3404.2.9.6.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Protected tanks require secondary containment, drainage control or diking in accordance with CFC, Sec. 2704.2 | CFC, Sec. 3404.2.9.6.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. A means shall be provided to establish the integrity of second containment in accordance with NFPA 30. | CFC, Sec. 3404.2.9.6.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Vehicle impact protection is required, either incorporated into the system or by guard posts, or both. | CFC, Sec. 3404.2.9.6.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Protected aboveground tanks shall be provided with overfill prevention. | CFC, Sec. 3404.2.9.6.6 |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Tank openings in protected tanks shall be on the top only. | CFC, Sec. 3404.2.9.6.9 |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Antisiphon devices required on all piping extending below the top level of the tank. | CFC, Sec. 3404.2.9.6.10 |

CHK N/A V. Additional Requirements for Aboveground Vaults

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|--------------------------|--------------------------|--|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Listed in accordance with UL 2245. | CFC, Sec. 3404.2.8.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Vault location distances to property lines, public ways and important buildings of NFPA 30, Table 4.3.2.1.1(b) are permitted to be reduced by 1/2 but not less than 5 ft. | CFC, Sec. 3404.2.9.5.1.1, Exc. 3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Listed aboveground tanks permitted to be installed in vaults. | NFPA 30, Sec. 4.2.7.2 & Sec. 4.2.7.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Tank completely enclosed within vault. No openings except those necessary for access, inspection, filling, emptying and venting. | CFC, Sec. 3404.2.8.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Vaults shall be substantially liquid tight. | CFC, Sec. 3404.2.8.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Sufficient clearance between tank and vault to allow for inspection and maintenance. | CFC, Sec. 3404.2.8.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Anchored to prevent uplifting by flooding. | CFC, Sec. 3404.2.8.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Shall be resistant to damage from motor vehicle impact or protected by guard posts. | CFC, Sec. 3404.2.8.6 |

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| <input type="checkbox"/> | <input type="checkbox"/> | 9. Connections provided for ventilating vault | CFC, Sec. 3404.2.8.8 |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Liquid (including water) detection system and alarm required | CFC, Sec. 3404.2.8.10 |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Vapor and liquid detection system with audible and visual alarms. | CFC, Sec. 3404.2.8.11 |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Means provided to remove liquid from vault. | CFC, Sec. 3404.2.8.12 |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Normal vents shall terminate at least 12 ft. above ground level. | CFC, Sec. 3404.2.8.13 |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Emergency vents shall be permitted to discharge inside vault. | CFC, Sec. 3404.2.8.14 |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Accessway provided. | CFC, Sec. 3404.2.8.15 |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Means provided to admit fire suppression agent.. | CFC, Sec. 3404.2.8.16 |
| <input type="checkbox"/> | <input type="checkbox"/> | 17. Overfill protection provided in accordance with CFC, Section 3404.2.9.6.6. | CFC, Sec. 3404.2.8.18 |

CHK N/A VI. Generator Fuel Supply/Return Piping

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|--------------------------|--------------------------|--|---------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Provisions shall be made for pressure testing of piping. | CFC, Sec. 3403.6.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Protected from corrosion and galvanic action. | CFC, Sec. 3403.6.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Piping protected from vehicle damage by guard posts or other approved means. | CFC, Sec. 3403.6.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Supports protected by 2-hr fire rating or other approved means. | CFC, Sec. 3403.6.8 |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Approved metallic or nonmetallic flex connectors permitted to protect the piping. | NFPA 37, Sec. 6.8.2.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Valves shall be provided to control normal flow and shut off flow for breaks | NFPA 37, Sec. 6.8.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Fuel piping shall be of compatible metal to minimize electrolysis and be properly sized. | NFPA 110, Sec. 7.9.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Galvanized fuel lines shall not be used. | NFPA 110, Sec. 7.9.3.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Approved flexible fuel lines shall be used between the prime mover and the fuel piping. | NFPA 110, Sec. 7.9.3.2 |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Fuel line solenoids shall be battery powered. | NFPA 110, Sec. 7.9.9 & Sec. 5.6.3.2.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. EPS piping shall be designed to minimize damage from earthquakes. | NFPA 110, Sec. 7.11.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 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 |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Gravity feed to generator not permitted. | NFPA 37, Sec. 6.5.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Spill control, drainage control & secondary containment not required for piping connected to systems. See NFPA 30, Sec. 5.2.1 and ANSI/ASME B31. | CFC, Sec. 3403.6.2 |

CHK N/A VII. Tank Venting

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|--------------------------|--------------------------|--|-------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 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. 3404.2.7.3.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 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 |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Piping for normal venting shall discharge vertically or horizontally and shall not be trapped by eaves or other obstructions. | CFC, Sec. 3404.2.7.3.3 |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Piping for normal venting shall drain back to tank. | CFC, Sec. 3404.2.7.3.4 |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Vent piping shall not be manifolded unless otherwise required. | CFC, Sec. 3404.2.7.3.5 |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Normal vent line piping not used for any other purpose. | CFC, Sec. 3404. 2.7.3.1 |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Vent piping protected from vehicle damage by guard posts or other approved means. | CFC, Sec. 3403.6.4 |

- 8. Aboveground tanks require additional emergency venting. **CFC, Sec. 3404.2.7.4**
- 9. Emergency vents shall not discharge inside buildings. **CFC, Sec. 3404.2.7.4**

CHK N/A VII. Temporary Installations

- 1. During construction, temporary aboveground storage tanks shall be in accordance with the provisions of CFC Sec. 3406.2.1 through 3406.2.8.1 **CFC, Sec. 3406.2**

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 Policy Intent Notices and Code Application Notices.

<http://www.oshpd.ca.gov/FDD/Regulations/CANs/index.html>

OSHPD Project Review Status

http://www.oshpd.ca.gov/FDD/project_status/index.asp

OSHPD Public Use Forms

<http://www.oshpd.ca.gov/FDD/Forms/index.html>