NATIONAL FIRE PROTECTION ASSOCIATION

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NFPA Technical Committee on Tank Storage and Piping Systems (FLC-TAN)

MEETING AGENDA
NFPA 30 First Draft (A2023)

[Web/Teleconference]

Monday June 28 and Tuesday June 29

11:00 AM – 3:30 PM ET

To join the Meeting: Contact Yiu Lee at ylee@nfpa.org

1. Call to Order. John Richmond Sr., Acting Chair.
2. Introductions.
3. Approval of Meeting Minutes from August 1 and 2, 2019 **(Attachment A)**
4. Staff Updates. Michael Marando, NFPA Staff
    - Staff Liaison Presentation
    - Committee Membership Roster (FLC-TAN) – Technical Committee on [Tank Storage and Piping Systems] **(Attachment B)**
5. Review of Public Input. (**Attachment C**)
6. New Business.
7. Next Meeting.
8. Adjournment.

NATIONAL FIRE PROTECTION ASSOCIATION

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NFPA 30 SECOND DRAFT MEETING MINUTES

Technical Committee on Tank Storage and Piping Systems

Thursday, August 1 and Friday, August 2, 2019

Crowne Plaza Minneapolis Northstar Downtown, Minneapolis, MN with Web/Teleconference Option

1. Call to Order & Chairman's Opening Remarks. The meeting was called to order at 1:15 p.m. (CDT) on Thursday, August 1, 2019 by the Technical Committee Chairman Stephen Haines. The purpose of the meeting was to review the NFPA 30 Public Comments and develop proposed Revisions recommended by the committee.

2. Chairman's Remarks. Stephen Haines then welcomed the members of the Technical Committee and thanked them for participating in the meeting. He reviewed the agenda and outlined the sequence for the 4 active task groups. Stephen also noted that the Committee would hear a presentation from BP and Phil Meyers that would support a Public Comment, PC No. 69 handled earlier by FLC-OPS but also related to requirements within the purview of TAN.

3. Introduction of Committee Members and Guests. Staff read the names of the Committee members to identify who was participating in the teleconference. Members were asked to review their current committee information and to e-mail all updates/changes to Diane Matthews to dmatthews@nfpa.org

TECHNICAL COMMITTEE MEMBERS WHO PARTICIPATED:

NAME	COMPANY
Stephen Haines, *Chair*	Haines Fire & Risk Consulting Corp.
Guy Colonna, *Staff Liaison*	NFPA
Steven Allwein, *Principal*	Morrison Brothers Company
Tim Blackford, *Principal*	Chevron Energy Technology Company/Representing American Petroleum Institute
Claire De Taeye, *Principal, via web/teleconference*	Travelers Insurance Company
Mark Fasel, *Principal*	Viega LLC
Wayne Geyer, *Principal*	Steel Tank Institute/Representing Steel Tank Institute/Steel Plate Fabricators Association
Philip Myers, *Principal*	Pemy Consulting LLC

David Nugent, *Principal, via web/teleconference*	TUV SUD American Inc./Global Risk Consultants
Duane Rehmeyer, *Principal, via web/teleconference*	Baker Engineering & Risk Consultants, Inc.
Robert Renkes, *Principal*	Fiberglass Tank & Pipe Institute
John Richmond, Sr., *Principal, via web/teleconference*	Eastman Chemical Company
James Rocco, *Principal, via web/teleconference*	Sage Risk Solutions, LLC/Representing Petroleum Marketers Association of America
Clark Shepard, *Principal*	ExxonMobil Corporation
John Woycheese, *Principal, via web/teleconference*	Saudi Aramco
Robert Young, *Principal*	Petroleum Equipment Institute
R. Jeff Tanner, *Voting Alternate, via web/teleconference*	Michigan Department of Environmental Quality
Charles Lovell Bogert, *Alternate to J. Bagnall*	Burns & McDonnell
Alwin Kelly, *Alternate to A. Cole, via web/teleconference*	JENSEN HUGHES
Timothy Murphy, *Alternate to C. De Taeye, via web/teleconference*	Travelers Insurance Company
Alfredo Ramirez, *Alternate to R. Riegel*	UL LLC
Jeffrey Shapiro, *Alternate to W. Geyer*	International Code Consultants/Representing Steel Tank Institute/Steel Plate Fabricators

TECHNICAL COMMITTEE PRINCIPAL MEMBERS WHO DID NOT PARTICIPATE (WHOSE ALTERNATES DID NOT ATTEND):

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John Cignatta	Datanet Engineering, Inc.
Charles Davis	AECOM/URS Corporation
Dwight Havens	Fluor Marine Propulsion, LLC
Gregory Kirby	Cytec Solvay Group
Thomas Lentz	Aon Risk Services, Inc.
David Wechsler	Consultant/Representing American Chemistry Council
Peter Willse	AXA XL/Global Asset Protection Services, LLC

GUESTS

NAME	COMPANY
Scott Boorse	PEI
John LeBlanc	FM Global
Mike Marando	NFPA

4. Previous Meeting Minutes. The minutes of the August 3, 2018 First Draft Meeting Minutes were reviewed and approved as written**.**

5. Revision Process. Procedures for in person and online participation and voting during the meeting were discussed by chair Stephen Haines.

6. Liaison Report. Staff reviewed the standards development process presentation for the Committee, outlining the Technical Committee members' roles, responsibilities, and conduct within the process, and presented the specific actions available to the committee during the course of this meeting. As this was a second draft meeting, Staff reviewed procedures for developing Second Revisions and also the criteria for "reject, hold" if needed when addressing potential new material.

NFPA 30 is currently in the A20 revision cycle, so staff also reviewed the upcoming milestones remaining in the schedule applicable to completing a new edition of the code. Earlier in the year, Committee Chairs and members were queried by the Standards Council regarding the inclusion of an "equivalency" provision within many of the NFPA documents. Based on the responses received, the Council continues to review any next steps regarding such provision in the varied and diverse NFPA documents.

7. Task Group Reports and Discussion of Potential NFPA 30 Second Revisions.

a. Piping Systems Task Group

No report was provided.

b. Tank Spacing Tables Task Group

No report was provided.

c. Well and Production Facilities Task Group

This applies to CI No. 460 and PC No. 69 on upstream operations. Phil Meyers and Yevgeniy Kondratenko reviewed the same information presented during the OPS meeting and accepted questions from any not in attendance during OPS earlier that day. The Task Group reconvened on the evening of August 1st to modify their report based on comments and concerns received from the technical committee members. A revised report was presented for consideration on August 2, 2019, and resulted in development and approval of a Second Revision placed in a new Chapter 26.

d. Definitions Task Group

This applies to Global FR 401 and Global SR 81. NFPA 30 Liquid Classification System Task Group – Report provided by John LeBlanc, as he submitted the PIs during the First

Draft stage that became a Global FR and revised the liquid classification to focus on a liquid's flash point and no longer on its name – flammable or combustible. The NFPA staff implementation of the Global FR (FR No. 401) did not capture all the necessary revisions to NFPA 30 as the new classification convention was implemented throughout the document, so Public Comments were submitted by John and others to correct the code. To assist in identifying the needed corrections, NFPA staff and John met in late June to review the published NFPA 30 as shown in Terra with First Draft updates and created the basis for a global Public Comment (this is PC No. 81). In addition to this PC, John also created several more PCs aimed at reconciling all the changes still needed to complete the changeover from use of flammable and combustible as an indicator for potential ignitibility of a liquid to just the flash point that then defines liquid class within the threshold flash points. John submitted additional PCs to include the abbreviation for flash point (FP) and boiling point (BP) as part of the defined terms so that the FP/BP naming can be used to shorten how liquid classification is written. Also related to this effort, the Committee approved several FRs amending the scope in 1.1.1, several definitions in Chapter 3, and a revised Chapter 4 (this work was developed by a task group meeting the evening of the first day and presented for approval as SRs on the second day; it links to Committee Input No. 503). Collectively, those changes lay the foundation for the implementation of the new liquid classification scheme – one now based on flash point (and in some cases boiling point) and no longer based on the use of the terms flammable or combustible liquid. Because the implementation of the global change in how liquids are named is the purview of Fundamentals, action on all the changes (essentially editorial as Global PC No. 81 outlines) will be voted on for approval by FLC-FUN. However, the changes spread through all the code, so John delivered this presentation to SWC, OPS, and TAN as well during their meetings. To ensure the changes are captured and reflected correctly throughout the document, staff will prepare the updates within Terra and provide a document for review by each of the committees prior to the date for the letter ballot (which is nominally early to mid-October). John believes this will ensure support for this change by all the committees and ensure the changes have all been reflected in the final document in time for letter ballots to be sent to the committees.

8. Review of FLC-TAN Public Comments.

BP gave a presentation on NFPA 30 Public Comment #69 which is assigned to FLC-OPS and shared with FLC-TAN for informational purposes only.

The Technical Committee reviewed twenty-two (22) Public Comments and six (6) Second Revisions were created. The Committee will be balloted on these Second Revisions.

9. Other Business. One item of new business raised by Wayne Geyer relates to scope overlap that possibly exists with tanks located inside buildings as part of back-up power, where NFPA 30, 31, and 37 all contain provisions that might be applicable. No specific action was taken in

regards to this question, but it is possible for a task group to be formed to review each document and any potential overlap or conflict.

9**. Future Meetings**. As this was the Second Draft meeting for the A20 revision to NFPA 30, no other meetings for FLC-TAN are required or planned for this cycle.

10. Adjournment. On Thursday, August 1, 2019, the meeting was adjourned at 5:30 p.m. (CDT). On Friday, August 2, 2019, the meeting reconvened at 8:00 a.m. With no further business, the meeting was adjourned at 10:35 a.m. (CDT) on Friday, August 2, 2019**.**

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Attachment C

Public Input No. 65-NFPA 30-2021 [Section No. 21.4.2.1.1]

21.4.2.1.1*

Atmospheric tanks designed and constructed in accordance with any of the following recognized engineering standards shall be deemed as meeting the requirements of 21.4.2.1:

(1)

(2)

(3)

(4) API Specification 12B, ~~*Bolted Tanks for Storage of Production Liquids*~~

(5) ~~API Specification 12D, *Field Welded Tanks for Storage of Production Liquids*~~

(6) ~~API Specification 12F, *Shop Welded Tanks for Storage of Production Liquids*~~

(7) ~~API Standard 650, *Welded Tanks for Oil Storage*~~

(8) ~~UL 58, *Steel Underground Tanks for Flammable and Combustible Liquids*~~

(9) ~~UL 80, *Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids*~~

(10) ~~UL 142, *Steel Aboveground Tanks for Flammable and Combustible Liquids*~~

(11) ~~UL 142A, *Safety for Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids*~~

(12) ~~UL 1316, *Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures*~~

(13) ~~UL 2080, *Fire Resistant Tanks for Flammable and Combustible Liquids*~~

(14) ~~UL 2085, *Protected Aboveground Tanks for Flammable and Combustible Liquids*~~

(15) ~~UL 2258, *Aboveground Nonmetallic Tanks for Fuel Oil and Other Combustible Liquids* , where used in accordance with the provisions in 21.4.1.5~~

Statement of Problem and Substantiation for Public Input

The API 12 Series references will be moved to the proposed new upstream chapter.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 64-NFPA 30-2021 [Section No. 2.3.1]	references

Submitter Information Verification

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Submittal Date:	Sat May 22 23:18:06 EDT 2021
Committee:	FLC-TAN

Public Input No. 1-NFPA 30-2020 [New Section after 21.5.2.5]

New 21.5.2.6

Rectangular shop-fabricated aboveground tanks shall be tested for tightness either hydrostatically or with air pressure at not less than a gauge pressure of 0.5 psi (3 kPa) and not more than a gauge pressure of 1.5 psig (10 kPa).

Additional Proposed Changes

File Name	Description	Approved
R912_Installation_Instructions_Nov_2015.pdf	R912 Tank Installation and Testing	

Statement of Problem and Substantiation for Public Input

Telecom companies are mandated to have adequate backup power and fuel to maintain essential communications in emergencies that often include commercial power outages. This is often addressed by the installation of standby engine driven generators with associated fuel tanks. In section 21.4.2.1.4 there is a distinction between cylindrical and rectangular tanks. But in section 21.5 on testing, there are only references to vertical and horizontal tanks (which I assume are for cylinders). The is no mention of testing for rectangular tanks. Other industry practices, such as Steel Tank Institute Recommended Practice R912, include a procedure for rectangular tanks. See attached. Since the current NFPA 30 text seems silent on testing of rectangular tanks, it is recommended to insert the rectangular tank test procedure from STI R912 into this section.

Truly yours,

Submitter Information Verification

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Submittal Date: Mon Dec 07 12:11:17 EST 2020
Committee: FLC-TAN

STI SPFA Celebrating 100 Years

Shop Fabricated Stationary Aboveground Storage Tanks For Flammable, Combustible Liquids

R912

INSTALLATION INSTRUCTIONS

November 2015

1 TANK SITE EVALUATION AND PREPARATION PRIOR TO INSTALLATION

1.1 The foundation for the tank must be designed to support the tank plus 100% of its contents when full. The design shall also take into account the type of support that is being used and the point load associated with that support. The foundation may be constructed using concrete, asphalt, gravel or other stable material and must include provisions in its design to prevent tank movement. The foundation should include any provisions necessary for seismic design. The foundation design must also include provision for draining surface water away from the tank.

1.2 For tank installations without cathodic corrosion protection, the tank should be grounded in accordance with applicable electrical and fire code standards.

1.3 Where the steel tank body is in contact with the earth, use a zinc grounding rod. Do not use a copper grounding rod.

1.4 Where the tank body is in contact with the earth or foundation, it should be protected from external corrosion. For external corrosion protection using cathodic corrosion protection, consult applicable standards (e.g. National Association of Corrosion Engineers) to provide the tank with appropriate protection from lightning without interfering with the corrosion protection. Steel tanks in contact with the earth should not use copper grounding. Refer to STI R893-89, "Recommended Practice for External Corrosion Protection of Shop Fabricated Aboveground Storage Tank Floors."

1.5 Tanks located in areas subject to flooding must be protected against floatation.

1.6 Aboveground tanks should not be located above underground utilities or directly beneath overhead power lines.The tank shall be protected from vandalism and accidental damage in accordance with all applicable codes, NFPA 30, NFPA 30A, UFC, etc.

2 TANK HANDLING

2.1 Do not handle or install tank without having knowledge and experience in procedures involved with proper and safe installation of an aboveground tank used for storage of stable, flammable and combustible liquids. To avoid tank damage, use skilled, professional installers.

2.2 Equipment for handling the tank shall be of adequate size to lift and position the tank. DO NOT DROP OR DRAG THE TANK.

2.3 Tanks shall be carefully handled. Use cables or chains of adequate length (with spreader bars, if necessary) and size. Attach to the tank using the lifting lugs provided. Care should be taken that the angle between the two cables, at the lift point, shall be no greater than 60 degrees.

2.4 DO NOT HANDLE OR MOVE THE TANK UNLESS IT IS EMPTY.

2.5 This is a stationary tank. Do not use this tank for transport of any product.

3 TESTING

3.1 GENERAL REQUIREMENTS

3.1.1 An on-site air test of the tank may be required by local authorities to ensure no damage has occurred in shipping and handling. All testing shall be performed as described in paragraph 3.2 below.

3.1.2 If the manufacturer has shipped the double wall tank with a vacuum on the space between the walls, read and record the vacuum pressure. If the vacuum gauge reading has dropped more than 2 inches Hg (40.5 6.77 kPa) from the level at which it was shipped, from contact the tank manufacturer.

3.1.3 In lieu of the air pressure test described in paragraph 3.2 below, a vacuum may be applied to the interstice of a double-wall tank or to the interstice of a double-bottom tank.

NOTE: This test procedure may be difficult to conduct for large (greater than 2000 gallons) tanks because of the greater volume of space to be evacuated and difficulty in sealing the tank openings. DO NOT APPLY A VACUUM TO THE PRIMARY TANK OF A DOUBLE-WALL TANK OR TO A SINGLE-WALL TANK. A vacuum of 6 inches Hg (20.3 kPa) is to be applied to the interstice. The vacuum shall be held without a loss for one hour on tanks less than 20,000 gallons and for 2 hours for tanks greater than or equal to 20,000 gallons. If this vacuum cannot be held for the specified time interval, then perform the air test procedure described in paragraph 3.2.

3.1.3.1 Caution must be taken in applying a vacuum to the interstice of a tank and the testing must be stopped if any deformation appears on the tank.

3.2 AIR PRESSURE TEST PROCEDURE FOR TANKS

3.2.1 If the tank is equipped with a long-bolt manway for emergency venting, do not remove the long-bolts from the long-bolt manway. Instead, long-bolt manways must be secured with C-clamps of appropriate size and strength to hold the vent cover in the sealed position to maintain the tank pressures required. If tank is equipped with standard emergency vents, remove emergency vents and cap openings to hold tank pressure as required.

NOTE: Use only calibrated air pressure gauges with a 0-15 psig (0-103 kPa) dial span. The relief valve must have a flow rate at the set pressure that is greater than the flow rate of the air supply line. The regulated air supply test pressure used for this test should be as follows:

a. **HORIZONTAL CYLINDRICAL (AND DIKED TANKS, IF APPLICABLE) TANKS** - Not less than 3 psig (20.7 kPa) nor more than 5 psig (34.5 kPa). Set the pressure relief valve in the air supply line at 5.5 psi (38 kPa).

b. **VERTICAL TANKS** - Not to be less than 1 ½ psig (10.4 kPa) nor more than 2 ½ psig (17 kPa) or that gauge pressure above 1 ½ psig (10.4 kPa) which first causes visible deformation of the tank. Set the pressure relief valve in the air supply line at 2 ½ psig (17 kPa).

c. **RECTANGULAR** TANKS - Not more than 1 ½ psig (10.4 kPa). Set the pressure relief valve in the air supply line at 1 ½ psig (10.4 kPa). This 1 ½ psig (10.4 kPa) pressure is to be used for testing tanks in the field ONLY. In-shop testing will be performed at a different pressure.

CAUTION: Do not leave pressurized tank unattended while the air supply line is connected. Do not stand in front of tank heads or fittings when pressurizing tank.

Pressurizing of large tanks may result in the slight deformation bulging of the tops and bottom of vertical tanks, bulging of the sides of rectangular tanks, and bulging of the heads and ends of cylindrical tanks. Should visible bulging occur or deformation appears severe, immediately relieve the pressure. Aboveground vertical tanks may have a "weak shell to roof" seam. Do not air pressure test a tank with a "weak shell to roof" seam. Rather, fill these tanks with water and check for leaks.

3.2.2 SINGLE-WALL TANK PRESSURIZING PROCEDURE

3.2.2.1 Install test piping as shown in Figure Temporarily plug, cap or seal off remaining tank openings to hold pressure.

3.2.2.2 Close valves A and B.

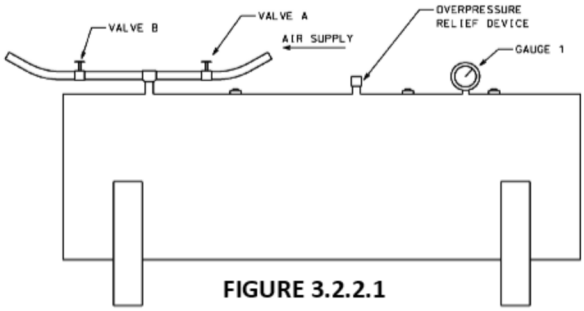


FIGURE 3.2.2.1
SINGLE-WALL TANK

3.2.2.3 Connect regulated test air supply line to test piping as shown in Figure 3.2.2.1.

3.2.2.4 Slowly open valve A to pressurize the tank. Pressure gauge 1 should indicate test air pressure given in paragraph 3.2.1 above. Close valve A. Disconnect regulated test air supply line from test piping.

3.2.2.5 Proceed to paragraph 3.2.4 "Detection of Leaks" below.

3.2.3 DOUBLE-WALL TANK PRESSURIZING

3.2.3.1 The following air pressure testing does not apply to double-wall tanks equipped with interstitial vacuum monitoring systems. In lieu of the air pressure test, the tank may be shipped from the factory with a vacuum in the tank interstice.

Read and record the vacuum pressure. If the vacuum pressure, gauge reading is less than 12 inches Hg (40.5kPa) contact the tank manufacturer.

3.2.3.2 Install test piping as shown in Figure 3.2.3.2. Temporarily plug, cap or seal off remaining tank openings to hold pressure.

3.2.3.3 Close valves A and B. Open valve C.

3.2.3.4 Connect regulated test air supply line to test piping as shown in Figure 3.2.3.2.

3.2.3.5 Slowly open valve A to pressurize the primary tank. Pressure gauge 1 should indicate test air pressure given in paragraph 3.2.1 above.

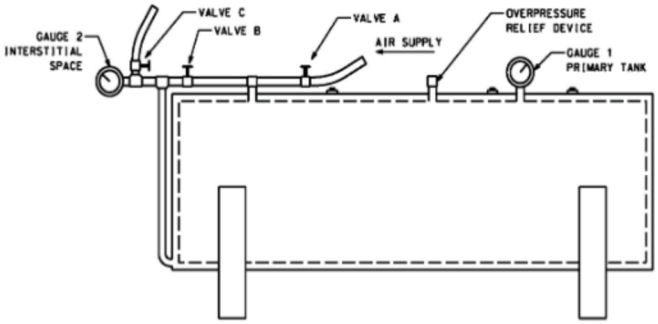


FIGURE 3.2.3.2
DOUBLE-WALL TANK

3.2.3.6 Close valve A. Disconnect regulated test air supply line from test piping.

3.2.3.7 Monitor test pressure in primary tank for 1 hour minimum. A steady drop in pressure reading for gauge 1 indicates there may be a leak in the primary tank. Check the fittings, and gauge, then retest. If the problem persists, contact the tank manufacturer.

3.2.3.8 If no leaks are found, close valve C and slowly open valve B to pressurize the interstitial space between the double walls of the tank. Pressure gauge 1 will indicate a slight drop in test pressure when valve B is opened, but should hold steady at the lower pressure. If test pressure drops below minimum requirements, close valve B, reconnect air supply line and slowly open valve A to increase pressure in primary tank. When the required pressure is indicated on gauge 1 close valve A, disconnect test air supply line. Open valve B to equalize pressure in the primary tank and the interstitial space. Gauge 1 and gauge 2 should have the same pressure reading.

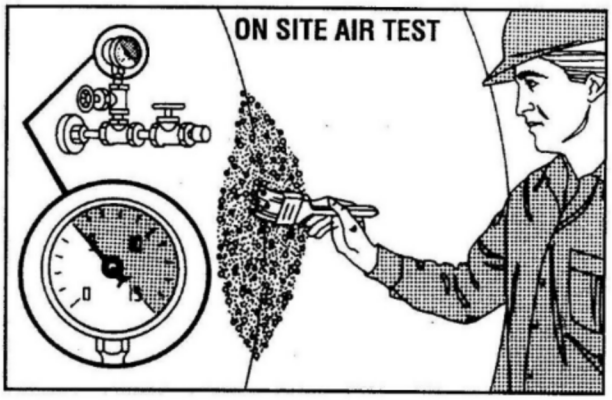
WARNING: Do not apply air pressure to the interstitial space between the walls of a double wall tank without air pressure in the primary tank.Do not apply air pressure to the interstitial space that is higher than the air pressure in the primary tank. Damage to the tank may result.

3.2.3.9 Close valve B. Hold test pressure in interstitial space for 1 hour minimum. A steady drop in pressure gauge 2 indicates there may be a leak in the interstitial space. Check the fittings, the gauges, and then retest. If the problem persists, contact the tank manufacturer.

3.2.3.10 Proceed to paragraph 3.2.4 “Detection of Leaks” below.

3.2.4 DETECTION OF LEAKS

3.2.4.1 Immediately apply leak test solution to tank exterior surfaces, welds, fittings, etc. Check for leaks. No leaks are permitted. If leaks are found, notify the tank manufacturer. If no leaks are found, testing of the tank is complete.



3.2.4.2 For single-wall tank, open valve B, then slowly open valve A to release test air pressure. For double-wall tank, open valve C, then slowly open valve B to release test air pressure.

3.2.4.3 **WARNING:** Emergency relief vents and long bolt manways must be operable to prevent causing tank failure by over-pressurization.

4 TANK PIPING AND ACCESSORIES

4.1 Install all permanent piping and fittings using compatible, non-hardening thread sealant material.

4.2 All unused tank openings must be properly sealed and tested to be liquid and vapor tight prior to putting the tank into service.

4.3 DO NOT WELD ON THE TANK, MODIFY OR PENETRATE THE TANK STRUCTURE IN ANY WAY WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE TANK MANUFACTURER.

4.4 All tank accessories shall be installed as required per local codes. Anti-siphon devices, overfill shut-offs and alarms, vents gauges, emergency vents, etc. are common requirements for tanks storing motor fuels for the purpose of being dispensed into motor vehicles.

5 MAINTENANCE

5.1 The tank operator should perform periodic walk-around inspections to identify and repair areas of damage to the tank or the coating. Check for proper drainage around the tank area.

5.2 It is imperative that the tank exterior be inspected periodically to ensure that the integrity of the coating is maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the tank is located. Special consideration should be given to the selection of the paint, surface preparation and coating application. The coating selected should be suitable for use with the current coating, or the existing coating should be removed. The coating selected should be of industrial quality.

5.3 Proper site preparation and maintenance are vital to ensure drainage of surface water. Should ground conditions change or settlement occur, take the appropriate steps to maintain proper drainage and prevent standing water near or under the tank area.

5.3.1 For diked tanks, remove any product spills immediately. Be sure to dispose of hazardous material properly.

5.3.2 For diked tanks fitted with a drain, drain off water only. Drain openings are required to be maintained liquid tight.

5.4 The primary tank should be inspected monthly for the presence of water at the lowest possible points inside the primary tank. Remove any water found. Water and sediment in fuel can cause plugging of filters. Also, bacterial growth, in this media, can cause filters to plug and cause corrosion of tanks and lines. For procedures on how to check for the presence of water and removal of water, refer to STI RP111, Storage Tank Maintenance. For copies of the RP and more information, please go to www.steeltank.com.

5.5 Tank relocation requirements – Aboveground storage tanks are often relocated. The following instructions are to be followed when this occurs. All steps are to be documented and the documentation is to be kept for the life of the tank.

5.5.1 The hazards associated with the cleaning, entry, inspection, testing, maintenance or other aspects of ASTs are significant. Safety considerations and controls should be established prior to undertaking physical activities associated with ASTs. Cleaning of tanks must be per state and local jurisdiction requirements.

5.5.2 Refer to STI Standard SP001, "Standard for the Inspection of Aboveground Storage Tanks" for requirements concerning tank inspections. This SP001 Standard details requirements for inspections based on the tank installation and age. A tank must undergo the appropriate inspection prior to relocation.

5.5.3 The tank must be subjected to a pressure (or vacuum) test as detailed paragraph 3.2 above except an inert gas, such as nitrogen, should be used for tanks that have previously held fuel.

Public Input No. 133-NFPA 30-2021 [Section No. 21.6.5.1]

21.6.5.1*

An emergency plan, consistent with the available equipment, resources, and personnel, shall be established and implemented to respond to fires and explosions, and other emergencies. This plan shall address the following:

(1) Procedures to be used in case of fire, explosion, or accidental release of ~~ignitible~~ ignitable (flammable or combustible) liquid or vapor including, but not limited to, sounding the alarm, notifying the fire department, law enforcement, mutual aid organizations (if available), evacuating personnel, controlling and mitigating the explosion, and controlling and extinguishing the fire

(2) Appointing and training of personnel to carry out emergency response duties

(3) Maintenance of fire protection, spill control and containment, and other emergency response equipment

(4) Risk recognition of legacy foams containing Per and Polyfluoroalkylated substances (PFAS) foams, and its related Synthetic Fluorine Free Foams

(5) Conducting emergency response drills, including mutual aid

(6) Shutdown or isolation of equipment to control unintentional releases

(7) Alternative measures for the safety of personnel while any fire protection or other emergency response equipment is shut down or inoperative

Statement of Problem and Substantiation for Public Input

Many facilities, especially terminals have mutual aid, either from the neighboring petrochemical facilities or if none is close-by, then the municipal fire department need to know the risk, Municipal fire departments are not trained for NFPA 1081. In addition, pre-fire planning need to access the risk on the use of legacy foams containing C8 PFAS surfactants.
Refer to NFPA 11, Annex on environmental issues with the legacy foam.

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Public Input No. 3-NFPA 30-2020 [New Section after 21.7.1.5]

TITLE OF NEW CONTENT

21.7.1.5.2 Where an underground tank receives deliveries from a tank vehicle or rail car the transfer hose shall be disconnected from the fill pipe at the conclusion of each delivery.

Statement of Problem and Substantiation for Public Input

Transfer hoses that are left connected to fill pipes at the conclusion of a delivery should be considered part of the facility and would need to meet the requirements for aboveground piping. Since transfer hoses do not meet the standards for aboveground piping, the transfer hose needs to be properly emptied and disconnected from the fill pipe.

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Public Input No. 138-NFPA 30-2021 [Section No. 22.4.1.4]

22.4.1.4

Tanks storing ~~ignitible~~ ignitable (flammable or combustible) liquids with boil-over characteristics shall be located in accordance with Table 22.4.1.4. Liquids with boil-over characteristics shall not be stored in fixed roof tanks larger than 150 ft (45 m) in diameter, unless an approved ~~inerting~~ or listed inerting system is provided on the tank.

Table 22.4.1.4 Location of Aboveground Storage Tanks Storing Boil-Over ~~Ignitible~~ Ignitable (Flammable or Combustible) Liquids

Type of Tank	Protection	From Property Line that Is or Can Be Built Upon, Including the Opposite Side of a Public Way[a]	From Nearest Side of Any Public Way or from Nearest Important Building on the Same Property[a]	Minimum Distance (ft)
Floating roof	Protection for exposures[b]	½ × diameter of tank	⅙ × diameter of tank	
	-	None	Diameter of tank	⅙ × diameter of tank
Fixed roof	Approved or listed foam or inerting system[c]	Diameter of tank	⅓ × diameter of tank	
	-	Protection for exposures[b]	2 × diameter of tank	⅔ × diameter of tank
	-	None	4 × diameter of tank but need not exceed 350 ft	⅔ × diameter of tank

For SI units, 1 ft = 0.3 m.

[a]The minimum distance cannot be less than 5 ft.

[b]See definition 3.3.46, Protection for Exposures.

[c]See NFPA 69.

Statement of Problem and Substantiation for Public Input

Since NFPA accepts equipment that are both approved (example FM) or listed (example UL) or NRTL (Nationally Recognized Testing Laboratories), it is prudent to include this statement of "listed" as some inerting systems are listed but not approved.

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Public Input No. 144-NFPA 30-2021 [Section No. 22.4.2.1 [Excluding any Sub-Sections]]

Tanks storing Class I, Class II, or Class IIIA stable liquids [FP < 200°F (93°C) and any BP] shall be separated by the distances given in Table 22.4.2.1.

Table 22.4.2.1 Minimum Shell-to-Shell Spacing of Aboveground Storage Tanks

Tank Diameter	Floating Roof Tanks	Class I or Class II Liquids [FP < 140°F (60°C)]	Class IIIA Liquids [140°F (60°C) ≤ FP < 200°F (93°C)]	Fixed Roof or Horizontal Tanks
All tanks not over 150 ft (45 m) in diameter	⅙ × sum of adjacent tank diameters but not less than 3 ft (0.9 m)	⅙ × sum of adjacent tank diameters but not less than 3 ft (0.9 m)	⅙ × sum of adjacent tank diameters but not less than 3 ft (0.9 m)	
Tanks larger than 150 ft (45 m) in diameter:	-	-	-	
If remote impounding is provided in accordance with 22.11.1	⅙ × sum of adjacent tank diameters	¼ × sum of adjacent tank diameters	⅙ × sum of adjacent tank diameters	
If open diking is provided in accordance with 22.11.2	¼ × sum of adjacent tank diameters	⅓ × sum of adjacent tank diameters	¼ × sum of adjacent tank diameters	

Note:

(1) The “sum of adjacent tank diameters” means the sum of the diameters of each pair of tanks that are adjacent to each other. See also A.22.4.2.1.

(2) These separation distances are the minimum requirements; however, where "Quantitative Risk Analysis" or the "Hazard Analysis" in 6.4 demonstrates that the thermal radiation heat flux can impact the adjacent tank(s) and result in an escalation to the adjacent tanks within this minimum spacing, the distances shall be increased accordingly. It is recognized that for existing facilities, this may not be possible; however, cooling rings will be able to control exposure protection and preventing escalation to adjacent tanks.

Additional Proposed Changes

File Name	Description	Approved

SINGAPORE_SRC_FIRE_R_D_AOFST_3-27.pdf	This is an old study from the 1988 naphtha tank fire in Singapore (attached) section 2.4 which made some changes in the Singapore standard SS 532-2007. I

Statement of Problem and Substantiation for Public Input

There have been many incidents, where fire on one tank quickly spread to the adjacent tanks. In 2019 alone, there were two incidents, one in Texas ship channel and another in California, both fully involved tank fires spread to adjacent tanks when they got too hot. This do not include the other incidents in other countries. Notice that most of these escalations are in tanks of 150-ft or less. Larger tanks typically located in refineries are well spaced and do not spread to other tanks as the radiation is exponentially reduced with increase in distance.

In the attached report, available on the internet, "An Application of Fire Science to an Industrial Incident" to the 1988 Naphtha tank fire in Singapore, section 2.4 recommends cooling rings to be installed if the tank NFPA 30 tank spacing cannot be increased. Many other countries have similar requirements for tank shell and roof cooling of adjacent tanks. Due to copyright issues, I cannot share other codes and standards.

Today, with the availability of thermal radiation models, it is fairly easy to model heat exposure to adjacent tanks, especially when other parameters are not addressed, such as the height of the tank, where a fully involved tank fire on a tall tank will have it's flames view factor increase the shorter adjacent tank.
API 2021, "Management of Atmospheric Storage Tank Fires" clearly do not recommend using monitors to cool the tank, as the uneven cooling will result in a more detrimental impact of the exposed tank. Therefore, cooling rings provide uniform cooling of exposed tanks.

Finally, in the NFPA Fire Protection Research Foundation project "Evaluation of the fire protection effectiveness of fluorine free firefighting foams".
https://www.nfpa.org//-/media/Files/News-and-Research/Fire-statistics-and-reports/Suppression/RFeffectivenessFluorineFreeFoams.pdf
Sections 6.3 and 7.2 clearly states that tank cooling is important even when applying foam.

If given the opportunity, I would like to present to the committee some thermal radiation models (and its impacts) showing the view-factors impacting the adjacent tanks.

I would recommend that the committee set up a task group to revisit the spacing table, to leverage the advance models available to us today (including the SFPE handbook's section on fire dynamics, "point-source modeling"). For existing facilities, it is not a huge expense to install a cooling ring around the tank shell and roof where we recognize that it is not possible for tanks in terminals serving communities.

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Public Input No. 4-NFPA 30-2021 [Section No. 22.4.2.3]

22.4.2.3

Where tanks are in a diked area containing Class I or Class II liquids [FP < 140°F (60°C)] or in the drainage path of Class I or Class II liquids [FP < 140°F (60°C)] and are compacted in three or more rows or in an irregular pattern, it shall be required to make tanks in the interior accessible for fire-fighting purposes, and greater spacing or other means shall be permitted to be required by the authority having jurisdiction ~~to make tanks in the interior of the pattern accessible for fire-fighting purposes~~ .

Statement of Problem and Substantiation for Public Input

Section 22.4.2.3 could benefit from a revision to improve clarity that the interior of tank farms are required to be accessible for fire-fighting purposes.

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Public Input No. 142-NFPA 30-2021 [Section No. 22.4.2.4 [Excluding any Sub-Sections]]

The minimum horizontal separation between an LP-Gas container and a Class I, Class II, or Class IIIA [FP < 200°F (93°C)] liquid storage tank shall be 20 ft (6 m) unless thermal heat radiation models performed in 6 .2 "Hazard analysis", 6.4.1.2.2 (2) demonstrates that a higher separation distance is required.

Statement of Problem and Substantiation for Public Input

There are so many computer models available today which can identify the thermal radiation distance from the relief valve. In some cases, it may be more than 20-ft which can impinge on the nearby storage tank storing Class I or II which will rapidly increase the product temperature. Also, granted that other parameters such as tank inventory (resulting in duration), pressure, relief valve setting etc may affect the time for the tank contents to increase in temperature. This will ensure that designers do due diligence in performing the models instead of using 20-ft without giving much thought to the design parameters of the LPG tank and the storage tank.

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Public Input No. 23-NFPA 30-2021 [Section No. 22.7.1.1]

22.7.1.1

Every aboveground storage tank shall have emergency relief venting in the form of construction or a device or devices that will relieve excessive internal pressure caused by an exposure fire.

22.7.1.1.1

This requirement shall apply to each compartment of a compartmented tank, the interstitial space (annulus) of a secondary containment–type tank, and the enclosed space of tanks of closed-top dike construction.

22.7.1.1.2

This requirement shall also apply to spaces or enclosed volumes, such as those intended for insulation, membranes, or weather shields, that are capable of containing liquid because of a leak from the primary vessel. The insulation, membrane, or weather shield shall not interfere with emergency venting.

22.7.1.1.3

Tanks storing Class IIIB liquids [FP ≥ 200°F (93°C)] that are larger than 12,000 gal (45,400 L) capacity and are not within the diked area or the drainage path of tanks storing Class I or Class II liquids [FP < 140°F (60°C)] shall not be required to meet the requirements of 22.7.1.1.

22.7.1.1.4

Tanks with Foam-Water Sprinkler Systems designed, installed, and maintained per NFPA 16 and NFPA 25 shall not be required to meet the requirements of 22.7.1.1.

Statement of Problem and Substantiation for Public Input

Application of NFPA 16 Foam System to Eliminate Fire Relief Requirement

Eastman Chemical Company, 4/12/2021

NFPA 30 section 22.7 states the requirements for emergency relief venting for above ground storage tanks. However under certain circumstances, a tank's walls could weaken as they are heated beyond the coincident temperature at which the tank's pressure rating was calculated. At elevated temperatures, the tank could fail at the normal operating pressure of the vessel, i.e. below the set pressure of the relief device.

Examples:
1. Tanks containing High Boiling Chemicals: For tanks containing materials with high boiling points, the tank walls will exceed their temperature rating before the contents are vaporized. Many common materials such as heat transfer fluids, resins, and plasticizers are considered high boilers.
2. Vapor Space above Liquid: If a sufficient quantity of material is present, the time it would take to heat the liquid to its boiling point could allow the wall area of the vapor space to be heated to weakening and the normal operating pressure in the vapor space could rupture the vessel.
3. Tanks containing Supercritical Materials: At the relief temperature and pressure of some tanks, the contents would be supercritical. That is, the heat of vaporization becomes zero and there would be no evaporative cooling effect.
4. Non-ferrous Tanks: At temperatures much lower than carbon and stainless steel tanks (~400°F), the allowable stress of aluminum and copper decreases rapidly.

In addition to the wall temperature issue, section 22.7 does not address thermally unstable materials which could decompose into gas, or reactions that could be initiated which generate gas or high temperatures when the tank contents are heated beyond a safe limit.

In several of these examples, providing pressure relief for a fire induced over-temperature event is not likely possible. Another form of protection would be preferred or required. Per section 22.7.3.5, if appropriate insulation or deluge is applied to the tank the heat input rate can be reduced. But, in many installations, the optimum solution would be to eliminate the heat input entirely by extinguishing the fire using a Foam-Water Sprinkler System as defined in Chapter 1 of NFPA 16.

Most NFPA code users will make the logical connection between the need to provide venting for fire exposure as defined in NFPA 30 section 22.7 and completely eliminating the heat input from a fire by installing a NFPA 16 water-foam system. However, some users may not be aware that a water-foam sprinkler system designed, installed, and maintained to NFPA 16 and NFPA 25 will, in fact, extinguish a fire. Referencing the extinguishing capabilities of a NFPA 16 foam system (see NFPA 16 1.3.2.1) in section 22.7 of NFPA would be a benefit to many code users. Therefore, it is recommended to include the following verbiage in NFPA 30 section 22.7:

22.7.1.1.4 Tanks with Foam-Water Sprinkler Systems designed, installed, and maintained per NFPA 16 and NFPA 25 shall not be required to meet the requirements of 22.7.1.1.

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Public Input No. 63-NFPA 30-2021 [New Section after 22.7.4]

22.7.5 Relief Location.

Emergency relief devices, vents and vent pipe outlets shall be located and directed so that vapors will not accumulate or travel to an unsafe location, enter building openings, or be trapped under eaves and shall be at least 5 ft (1.5 m) from building openings and at least 15 ft (4.5 m) from powered ventilation air intake devices. If the hazard evaluation required in Section 6.4 requires a greater separation distance, the more restrictive distance shall apply.

Statement of Problem and Substantiation for Public Input

A high volume of heated vapor generation is expected in a fire relief scenario. The emergency vent should be off the ground, and directed to a location which does not impinge on egress, pedestrian and vehicular traffic, emergency response staging locations, critical equipment and buildings, and other sensitive exposures. The exemplar language is taken from 27.8.1.3 / 27.8.2.2, which only addresses normal venting, not emergency venting. Intent is to provide some prescriptive guidance but also defer to an engineering analysis for scenarios where the guidance may be insufficient. Annex language may be warranted to clarify this point.

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Public Input No. 143-NFPA 30-2021 [Section No. 22.8.1]

22.8.1

A fire-extinguishing and/or exposure protection system in accordance with an applicable NFPA standard shall be provided or made available for a storage tank where all of the following conditions apply:

(1) The tank is a vertical atmospheric storage tank that has a capacity of 50,000 gal (190 m^3) or more.

(2) The tank contains a Class I liquids [FP< 100°F (37.8°C)].

(3) The tank is located in a congested area where there is an unusual exposure hazard to the tank from adjacent property or to adjacent property from the tank

(4) The tank has a fixed-roof or a combination fixed- and floating-roof that does not meet the requirements of 22.2.2(2) or (3) to be classified as a floating roof tank.

Statement of Problem and Substantiation for Public Input

In congested areas, exposure protection in the means of cooling rings have proven to be affective in preventing escalation of adjacent storage tanks. in some countries, like Singapore standard SS 532-2007 "The Storage of Flammable Liquids", it requires cooling rings for exposure protection, many of this requirements stem from the Naptha fire in 1987..

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Public Input No. 6-NFPA 30-2021 [New Section after 22.11.2.2]

22.11.2.2.2

Type your content here ...The volumetric capacity calculation for the diked area shall include a provision to account for the management of fire-fighting water.

Statement of Problem and Substantiation for Public Input

As written, the code does not require fire-fighting water to be accounted for during the volumetric capacity calculation for a diked area. The committee should consider aligning with guidance from other regulatory bodies, such as IFC, 40 CFR 112, EPA's NPDES Program, API 2610, and EPA's guidance related to significant freeboard contained in section 4.3.2 of the Spill Prevention Control and Countermeasure rule.

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Public Input No. 7-NFPA 30-2021 [New Section after 22.11.2.4]

11.2.4.2

Define inspection requirements to achieve the design goal (liquid tight and able to withstand full hydrostatic head). In addition, provide information regarding the length of time a dike, berm or other secondary containment should be expected to withstand full hydrostatic head.

Statement of Problem and Substantiation for Public Input

Provide guidance on how to inspect secondary containment to verify design criteria, and identify the length of time a containment area is expected to be liquid tight and able to withstand full hydrostatic head. The ability to achieve the design criteria may be related to overall capacity.
Industry may benefit from defining inspection methods that can be used for verifying that the design criteria as specified is achieved.

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Public Input No. 8-NFPA 30-2021 [New Section after 22.11.2.7]

22.11.2.7.2

Provisions should include 1) a means for determining where the effluent contained in secondary containment will flow if the secondary containment fails; 2) a procedure to drain secondary containment during active fire-fighting efforts; and 3) requirements for routine inspection and maintenance of dikes and intermediate dikes (including frequency of inspection, measurements, suitability for contents, permeability assessment, leak testing, and documentation requirements.

Statement of Problem and Substantiation for Public Input

Provide guidance and consistency with NFPA 22.11.2.7 which seeks to prevent liquids in diked areas from entering natural water sources, public sewers, or public drains. Add clarity to expectations regarding routine inspections and maintenance to prevent accidental release.

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Public Input No. 125-NFPA 30-2021 [New Section after 22.11.4.5.1]

22.11.4.5.2

Where provided overfill prevention devices shall be listed in accordance with UL 2583 or approved.

Statement of Problem and Substantiation for Public Input

The code currently does not provide guidance on requirements that overfill prevention devices need to meet. The UL 2583 Outline of Investigation includes these requirements. However the proposal allows the devices to only be approved, rather than listed. Listed OPDs are available.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 120-NFPA 30-2021 [Section No. 2.3.9]	

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Committee: FLC-TAN

Public Input No. 2-NFPA 30-2020 [Section No. 23.11]

23.11 Control of Spills from Underground Storage Tanks.- ~~(Reserved)~~ -

Underground storage tanks receiving deliveries from a tank vehicle or rail car shall be filled through liquid tight connections within a spill container.

Statement of Problem and Substantiation for Public Input

This addition will make the requirements consistent with NFPA 30A 9.2.2.6.2

Submitter Information Verification

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Public Input No. 88-NFPA 30-2021 [Section No. 24.5.4]

24.5.4*

~~Storage tank buildings where Class IA liquids [FP < 73°F (22.8°C) and BP < 100°F (37.8°C)] are stored shall be designed to direct flame, combustion gases, and pressure resulting from a deflagration away from important buildings or occupied areas through the use of damage-limiting construction. The damage-limiting construction design shall be in accordance with NFPA 68 and shall be acceptable to the authority having jurisdiction.~~ The extent of required damage-limiting construction for storage tank buildings shall be determined in accordance with 6.4.1.2 and 6.8.

Statement of Problem and Substantiation for Public Input

Submitted by Operations Task Group on Explosion Control (one of many coordinated PIs). Intent of task group PIs is coordination and consolidation of requirements determining appropriate explosion control measures, as current treatment of this hazard is inconsistent throughout the various sections of NFPA 30.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 89-NFPA 30-2021 [Section No. 24.5.5]	

Submitter Information Verification

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Public Input No. 89-NFPA 30-2021 [Section No. 24.5.5]

24.5.5

Storage tank buildings where unstable liquids are stored shall be designed using an approved engineered ~~construction method that is intended to limit damage from an explosion (deflagration or detonation, depending on the liquid).~~ damage-limiting construction method in accordance with 6.8.

Statement of Problem and Substantiation for Public Input

Submitted by Operations Task Group on Explosion Control (one of many coordinated PIs). Intent of task group PIs is coordination and consolidation of requirements determining appropriate explosion control measures, as current treatment of this hazard is inconsistent throughout the various sections of NFPA 30.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 76-NFPA 30-2021 [Sections 6.4.1.1, 6.4.1.2, 6.4.1.3]	FLC-OPS Task Group on Explosion Control
Public Input No. 77-NFPA 30-2021 [New Section after 6.7]	FLC-OPS Task Group on Explosion Control
Public Input No. 79-NFPA 30-2021 [Section No. 9.16]	FLC-OPS Task Group on Explosion Control
Public Input No. 80-NFPA 30-2021 [Section No. 10.16]	FLC-OPS Task Group on Explosion Control
Public Input No. 81-NFPA 30-2021 [Section No. 12.16]	FLC-OPS Task Group on Explosion Control
Public Input No. 82-NFPA 30-2021 [Section No. 13.16]	FLC-OPS Task Group on Explosion Control
Public Input No. 83-NFPA 30-2021 [Section No. 17.3.7]	FLC-OPS Task Group on Explosion Control
Public Input No. 84-NFPA 30-2021 [Section No. 17.4.7]	FLC-OPS Task Group on Explosion Control
Public Input No. 85-NFPA 30-2021 [Section No. 17.6.13]	FLC-OPS Task Group on Explosion Control
Public Input No. 86-NFPA 30-2021 [Section No. 17.12]	FLC-OPS Task Group on Explosion Control
Public Input No. 87-NFPA 30-2021 [Section No. 17.15]	FLC-OPS Task Group on Explosion Control
Public Input No. 88-NFPA 30-2021 [Section No. 24.5.4]	FLC-OPS Task Group on Explosion Control

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Committee:	FLC-TAN

Public Input No. 140-NFPA 30-2021 [New Section after 24.9.1]

TITLE OF NEW CONTENT

Where required by this section, containment, drainage and spill control shall also comply with the requirements of Section 6.x except as modified by this section. Compliance with 24.9.2 through 24.9.6 shall be deemed as meeting 24.9.1.

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Statement of Problem and Substantiation for Public Input

This PI is a continuation of the coordination between sections required by Public Input No. 128, which proposes to create a section in Chapter 6 for the general requirements for containment, drainage, and spill control of liquids while retaining occupancy specific requirements in their appropriate chapters.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 128-NFPA 30-2021 [New Section after 6.7.9]	Creates the general requirements section 6.x to which this refers.

Submitter Information Verification

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Committee: FLC-TAN

Public Input No. 141-NFPA 30-2021 [Section No. 24.9.1]

~~24.9.1~~ –

~~Drainage systems shall be designed to minimize fire exposure to other tanks and adjacent properties or waterways. Compliance with 24.9.2 through 24.9.6 shall be deemed as meeting the requirements of 24.9.1 .~~

Statement of Problem and Substantiation for Public Input

This PI is a continuation of the coordination between sections required by Public Input No. 128, which proposes to create a section in Chapter 6 for the general requirements for containment, drainage, and spill control of liquids while retaining occupancy specific requirements in their appropriate chapters.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 128-NFPA 30-2021 [New Section after 6.7.9]	Creates the general requirements section 6.x to which this refers.

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Committee: FLC-TAN

Public Input No. 66-NFPA 30-2021 [New Section after 25.16]

TITLE OF NEW CONTENT

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Additional Proposed Changes

File Name	Description	Approved
NewUpstreamChapter26.pdf	New chapter 26 Well Sites for Petroleum Production	

Statement of Problem and Substantiation for Public Input

The upstream industry is currently unaddressed by NFPA even though it handles flammable and combustible liquids. This new chapter will allow existing upstream practices to be under the umbrella of NFPA 30 requirements.

Related Public Inputs for This Document

Related Input	Relationship
Public Input No. 65-NFPA 30-2021 [Section No. 21.4.2.1.1]	This new chapter requires references

Submitter Information Verification

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Committee: FLC-TAN

Chapter 26 (all new text)

Well Sites for Petroleum Production

***26.1 Scope:** This chapter shall apply to sites containing wells or associated support equipment and processes involved in the extraction, separation and storage of production fluid. Except as modified by this chapter, all other requirements of NFPA 30 shall apply.

***26.2 Definitions Specific to Chapter 26.** For the purpose of this chapter, the terms in this section shall have the definitions given.

26.2.1 Produced Oil. Oil derived from production fluid after other components of the production fluid mixture have been separated.

26.2.2 Produced Water – Water that has been mostly separated from other production fluid components but is expected to retain residual hydrocarbons.

26.2.3 Production Fluid. The fluid mixture of oil, gas, water and any other components that are extracted from a well.

26.3 Tank Design Standards. In addition to the tank types recognized by Section 21.4.2, the following design standards shall be permitted in applications specifically allowed by Sections 26.3.1 and 26.3.2.

(1) API Specification 12B, Bolted Tanks for Storage of Production Liquids

(2) API Specification 12D, Field Welded Tanks for Storage of Production Liquids

(3) API Specification 12F, Shop Welded Tanks for Storage of Production Liquids

(4) API Specification 12P Specification for Fiberglass Reinforced Plastic Tanks

26.3.1 Produced Oil Storage Tanks. Produced oil storage tanks shall comply with Section 21.4.2 or API Specification 12B, 12D, or 12F.

26.3.2 Produced Water Storage Tanks. Produced water storage tanks shall comply with Section 21.4.2 or API Specification 12B, 12D, 12F or 12P.

***26.4 Identification for Emergency Responders.** The tank marking required by Section 21.7.2.1 shall include a flammability hazard of “4” for production fluid storage tanks, produced oil storage tanks, and produced water storage tanks.

26.5 Control of Spills. Produced oil and water tanks constructed in accordance with API Specification 12P shall not be installed in the same diked area with tanks containing products other than produced water.

26.6 Emergeny Venting. Unless a produced oil storage tank is located in a remote location it shall be provided with emergency relief venting in accordance with Chapter 22.

A.26.1 Well sites for petroleum production are often referred to by the oil production industry as onshore, to differentiate land based vs. sea based production, and upstream, to indicate that they are generating feed stock to a refinery or other distribution outlet.

A.26.2 Wells generate "production fluid" that is typically separated at a well site into various components. Among these components are "produced water," which may contain enough light hydrocarbons on the surface to form a flammable atmosphere above the stored liquid, and "produced oil," which is the separated hydrocarbon liquid.

A.26.4 This section requires a flammability "4" placard with the intent of signaling firefighters responding to an emergency to maintain a safe distance because tanks at these sites might not meet traditional commercial tank construction requirements. Even though the flammability hazard of the stored material may not warrant a "4" classification, the use of that designation is to be conservative for these applications.

A.26.6 The 150-foot separation distance specified in this section was not based on a prescriptive assessment. It was viewed as a reasonable basis for introducing Chapter 26 into the code. In addition, there is some concern that there are tanks at these types of facilities that will not be provided with emergency vents, regardless of the fact that NFPA 30 continues to require them at this time. Plus, the new chapter permits the introduction of fiberglass tanks in accordance with API specification 12P, which didn't have a historic basis for tank spacing and separation. In moving this item forward, the technical committee planned to revisit the separation distance issue in a future code cycle.

Public Input No. 164-NFPA 30-2021 [Chapter 26]

Chapter 26 Reserved

Additional Proposed Changes

File Name	Description	Approved
FINAL_NFPA_30_Fuel_Systems_Public_Input_.docx	Final Draft; NFPA 30; Chapter 26	

Statement of Problem and Substantiation for Public Input

I have been installing fuel tanks and systems for 30 years and have been a member of several national committees developing standards and recommended practices for over 20 of those years. My company specializes in the design, installation, maintenance and even removal of systems related to heating, standby generators and Diesel driven pumps that all use light distillates such as Diesel, Kerosene and #2 Heating Oil. All of these fuel systems can be installed using the same criteria and indeed many are installed in such a way that they utilize the same supply tank(s) and equipment in common. The tank, piping and valve requirements could all be the same on these systems, but the NFPA standards didn't reflect that. There was no harmony between NFPA's 20, 30, 31, 37, and 110 as each was written by different committees using their own knowledge and experiences.

Working as Chair for PEI's RP1400; Recommended Practices for the Design and Installation of Fueling Systems for Emergency Generators, Stationary Diesel Engines and Oil Burner Systems, I found that these systems can easily operate, safely and efficiently, using the same criteria for the tanks, pipes and valves. Because of this and the disparity between the NFPA documents I approached NFPA to see if they would facilitate the rewriting of the related chapters and sections in these documents so that they would be harmonious. It became apparent that should we undertake this effort that the only way to maintain it for the long haul was to develop the standards as a new chapter for NFPA 30 and all the related standards could reference it and so not be affected by future edits made by each committee.

With that said, we are presenting our work for your review. We based it on NFPA 31 as it had, by far, the most written regarding the subject and then added what we could glean from the other standards so as to capture as much as possible from each. Of course we did make changes to update old requirements that are no longer needed or justified, but tried to keep as much as possible unchanged. It is mine and the Task Group's hope that you will accept this draft to be included as the new chapter 26 of NFPA 30.

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Committee: FLC-TAN

Chapter 1 Administration

1.1.2
This code shall not apply to the following:

~~(8) *Storage, handling, and use of fuel oil tanks and containers connected with oil-burning equipment~~
~~**A.1.1.2(8)**~~
~~See NFPA 31~~

1.3.10
Chapters 21 through 25 shall apply to bulk storage of ignitible (flammable or combustible) liquids in tanks other than those in Chapter 26.

1.3.~~10~~ 11
~~Chapter 27 shall apply to piping systems for transferring ignitible (flammable or combustible) liquids.~~

Chapter 26 shall apply to tanks, piping and components for use in appliances that use light distillates such as diesel and ~~number~~ #2 heating oil. This chapter also applies to similar biofuels.

1.3.~~11~~ 12
Chapter 27 shall apply to piping systems other than those in Chapter 26 for transferring ignitible (flammable or combustible) liquids.

Chapter 26 Tanks and Piping for Liquid Fuel-Burning Appliances

26.1* Scope.

This chapter shall apply to the following:

(1)* Tanks used to store or to supply liquid fuel for use in liquid fuel-burning appliances

A.26.1(1) such as used for heating, stand-by power or pumps.

(2)* Piping systems and components used to provide filling and venting of tanks and transfer of liquid fuel from tanks to appliances

A.26.1(2) such as used for heating, stand-by power or pumps.

A.26.1
Also see PEI RP-100 *Recommended Practices for Installation of Underground Liquid Storage Systems*, RP-200 *Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling*, and PEI RP-1400 *Recommended Practices for the Design and Installation of Fueling Systems for Emergency Generators, Stationary Diesel Engines and Oil Burner Systems* for additional guidance on these types of systems.

26.2 Definitions Specific to Chapter 26

Appliance – Any device that utilizes a fuel to produce heat, power, or to pump water.

Day Tank. A listed tank installed in the supply piping between appliances and its main fuel supply tank.

Engine Mounted Tank - A fuel tank furnished and mounted on the engine or engine-frame by the engine manufacturer. [**37**]

Engineered System: A tank and/or piping system of engineered components designed by the manufacturer to work together as a system

Fuel System - Any arrangement of pipe, tubing, fittings, connectors, tanks, controls, valves, and devices designed and intended to store, supply or control the flow of fuel. [**1192]**

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Integral tank. A tank that is furnished by the manufacturer as a part of the assembly that supplies fuel to appliances.

Main Tank. A separate fuel tank for supplying fuel to an appliance or day tank.

Sight Gauge. A continuous piece of clear tubing attached vertically to a fuel tank, connected at or near the top and bottom, used to give a visual indication of the fuel level in the tank.

26.3 Tanks
26.3.1 Basic Design and Construction of Tanks.
26.3.1.1

Tanks shall be designed and constructed to any shape or type consistent with sound engineering practice for the materials of construction used and shall be listed in accordance with one of the design standards specified in 26.3.1.7 or their approved equivalents. [**31**:7.2.1]

26.3.1.2

Tanks shall be installed and used in accordance with this standard and shall be approved for the specific appliance. [**31**:7.2.2]

26.3.1.3

Tanks meeting the requirements of Chapters 21, 22, and 23 shall be deemed as meeting the requirements of this section. [**31**:7.2.3]

26.3.1.4

Tanks shall be permitted to have combustible or noncombustible internal linings that are compatible with the intended liquid fuel(s). [**31**:7.2.4]

26.3.1.5

Tanks shall be sized so that the fuel is consumed within its 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. [**110**:7.9.1.3]

26.3.1.5 Tank Openings for Fill and Venting.
26.3.1.5.1*

All tanks shall be provided with top openings large enough to prevent abnormal pressures in the tank during normal operations (fill and withdrawal) and emergency venting (fire exposure for aboveground tanks), but not smaller than the nominal pipe sizes specified in Table 26.3.1.5.1. or as otherwise required by the listing of the tank.

Table 26.3.1.5.1 Minimum Diameter of Tank Vent Opening [31: Table 7.2.5.1]

Capacity of Tank (U.S. gal)	Diameter of Vent, Nominal Opening Size (in.)
660 or less	1¼
661 to 3,000	1½
3,001 to 10,000	2
10,001 to 20,000	2½
20,001 to 35,000	3

For SI units, 1 gal = 3.785 L, 1 in. = 25 mm.

A.26.3.1.5.1 Table 26.3.1.5.1 data up to 3,000 gallons were validated through testing with the Steel Tank Institute.

26.3.1.5.2

Normal and emergency vent opening(s) shall be permitted to be either separate or combined, provided openings are sized in accordance with Table 26.3.1.5.1. or as otherwise required by the listing.

26.3.1.5.3

Indoor venting shall only be allowed if approved.

26.3.1.5.4

Interstitial spaces of secondary containment tanks shall be provided with venting sized in accordance with Table 26.3.1.5.1. or as otherwise required by the listing.

26.3.1.5.4

Each compartment of a compartmented tank shall be provided with venting sized in accordance with Table 26.3.1.5.1. or as otherwise required by the listing.

26.3.1.6 Operating Pressures.
26.3.1.6.1

Tanks shall be permitted to be operated under normal operating conditions at pressures that do not exceed a gauge pressure of 1 psi (gauge pressure of 7 kPa), measured at the top of the tank, but shall be limited to a gauge pressure of 2.5 psi (gauge pressure of 17 kPa) under emergency venting conditions, also measured at the top of the tank. [**31**:7.2.6.1]

26.3.1.6.2

Where the vertical length of the fill and vent pipes is such that the static head imposed on the bottom of the tank exceeds a gauge pressure of 10 psi (70 kPa) if the pipes are filled with liquid, the tank and its related piping shall be tested hydrostatically to a pressure equal to the static head thus imposed. [**31**:7.2.6.2]

26.3.1.7 Design Standards.
26.3.1.7.1

Atmospheric tanks shall be constructed in accordance with one of the following or its approved equivalent:

(1) API Standard 650, *Welded Steel Tanks for Oil Storage*

(2) UL 58, *Standard for Steel Underground Tanks for Flammable and Combustible Liquids*

(3) UL 80, *Standard for Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids*

(4) UL 142, *Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids*

(5) UL 142A, *Standard for Special Purpose Aboveground Tanks for Specific Flammable and Combustible Liquids*

(6) UL 443, *Standard for Steel Auxiliary Tanks for Oil Burner Fuel*

(7) UL/ULC 1316, *Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures*

(8) UL 1746, *Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks*

(9) UL 2080, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids*

(10) UL 2085, *Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids*

(11) UL 2245, *Standard for Below-Grade Vaults for Flammable Liquid Storage Tanks*

(12) UL/ULC 2258, *Standard for Nonmetallic Tanks for Oil Burner Fuels and Other Combustible Liquids* [**31**:7.2.7.1]

26.3.1.7.2

Tanks intended for use inside buildings and with a capacity between 10 gal (38 L) and 1320 gal (5000 L) shall be constructed in accordance with 26.3.1.7.1(3), 26.3.1.7.1(4), 26.3.1.7.1 (6), 26.3.1.7.1 (9), 26.3.1.7.1 (10), or 26.3.1.7.1(12). [**31**:7.2.7.2]

26.3.1.7.3

Tanks intended for use inside buildings and with a capacity greater than 1320 gal (5000 L) shall be constructed in accordance with 26.3.1.7.1(4), 26.3.1.7.1(5), 26.3.1.7.1(9), or 26.3.1.7.1(10). [**31**:7.2.7.3]

26.3.1.7.4

Tanks intended for use outside aboveground with a capacity no greater than 1320 gal (5000 L) shall be constructed in accordance with 26.3.1.7.1(3), 26.3.1.7.1 (4), 26.3.1.7.1(5), 26.3.1.7.1(9), 26.3.1.7.1(10), or 26.3.1.7.1(12). [**31**:7.2.7.4]

26.3.1.7.5

Tanks intended for use outside aboveground with a capacity greater than 1320 gal (5000 L) shall be constructed in accordance with 26.3.1.7.1(1), 26.3.1.7.1(4), 26.3.1.7.1(5), 26.3.1.7.1(9), or 26.3.1.7.1(10). [**31**:7.2.7.5]

26.3.1.7.6*
Tanks intended for use underground shall be constructed in accordance with 26.3.1.7.1(2), 26.3.1.7.1(7), or 26.3.1.7.1(8). Tanks constructed in accordance with 26.3.1.7.1(2) shall be protected in accordance with either of the following:

(1) An approved cathodic protection system that is engineered, installed, and maintained in accordance with recognized standards

(2) Approved or listed external corrosion-resistant systems or materials integral with the tank [**31**:7.2.7.6]

A.26.3.1.7.6
See UL 1316, *Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures*; UL 1746, *Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks*; and STI ACT-100, *Specification for External Corrosion Protection of FRP Composite Steel Underground Tanks*, F894. [**31** :A.7.2.7.6]

26.3.1.7.7*
If a tank is installed in a vault outside the building, either above or below grade, the vault shall be constructed in accordance with 26.3.1.7.1(11). [**31**:7.2.7.7]

A.26.3.1.7.7

The type of vault being referred to in this paragraph is not the same as that referred to in 26.3.4.13.3 or 26.3.4.13.4. [**31**:A.7.2.7.7]

26.3.1.8 Areas Subject to Flood or Earthquake.
Where a tank is located in an area that is designated as subject to flood or earthquake, the following additional requirements shall apply to the tank, its connections, and its foundation and supports, as appropriate. [**31**:7.2.8]

26.3.1.8.1*
Where the tank is subject to flooding it shall be anchored.

A.26.3.1.8.1

Anchoring requirements may include NFPA 30, FEMA's *Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems* [Section 3.2 - New and Substantially Improved Buildings: Fuel Systems, 1999], or local requirements.

26.3.1.8.2*
When in a designated seismic zone, the local requirements for earthquake resistance shall be met. [**31**:7.2.8.2]

A.26.3.1.8.2
Potential requirements are in FEMA's *Principles and Practices for the Design and Construction of Flood Resistant Building Utility Systems* [Section 3.2 - New and Substantially Improved Buildings: Fuel Systems, 1999].

26.3.2 Supports and Foundations.

26.3.2.1*
Tanks and their supports shall rest on foundations made of solid concrete to minimize uneven settling.

A.26.3.2.1
Appendix E of API Standard 650, Welded Steel Tanks for Oil Storage, provides information on tank foundations. [**31**:A.7.3.1]

26.3.2.2
The tank foundation shall be designed to minimize corrosion in any part of the tank resting on the foundation.

26.3.2.3
Tank foundations with rain grooves or tanks with integral supports that provide an air gap between the tank and concrete shall be permitted.

26.3.2.4
Tank supports shall be able to withstand the load exerted and be of concrete, solid masonry, or steel.

26.3.2.5

For outside aboveground tanks, the supports shall be firmly anchored to the foundation.

26.3.2.6
Steel supports for any outside aboveground tank whose capacity exceeds 660 gal (2500 L) shall be considered protected if they meet one of the following methods and are approved by the authority having jurisdiction:

(1) They are protected by materials having a fire resistance rating of not less than 2 hours.

(2) They are not otherwise protected, but are less than 12 in. (0.3 m) high at their lowest point.

(3) They are protected by a water spray system that meets the requirements of NFPA 15 or NFPA 13. [**31**:7.3.4]

26.3.2.7
Every tank shall be supported in such manner that excessive concentrations of loads on the supporting portion of the shell are prevented. [**31**:7.3.5]

26.3.2.8
In areas subject to earthquake, tank supports and connections shall be designed to resist damage as a result of such shocks. [**31**:7.3.6]

26.3.3 Installation of Underground Tanks.

26.3.3.1
This section shall apply to tanks installed underground including those buried beneath structures.

26.3.3.2
Excavations for underground tanks shall be made in accordance with applicable building codes to avoid undermining the foundations of existing structures. [**31**:7.4.2]

26.3.3.3
Underground tanks and tanks buried beneath structures shall be located with respect to foundations and supports so that the loads carried by the latter cannot be transmitted to the tank. [**31**:7.4.3]

26.3.3.4
The distance from any part of an underground tank to the nearest wall of any basement or pit or to any property line shall not be less than 1 ft (0.3 m). [**31**:7.4.4]

26.3.3.5*
Underground tanks shall be installed in accordance with manufacturers' instructions and in accordance with applicable requirements of Chapter 23. [**31**:7.4.5]

A.26.3.3.5

For additional information, see PEI RP-100, *Recommended Practices for Installation of Underground Liquid Storage Systems* [**31**:A.7.4.5]

26.3.3.6

Underground tanks shall be equipped with vent opening(s) for each tank compartment ~~and interstitial space~~, which shall be arranged to discharge to the open air outside of buildings in accordance with 26.3.1.5.

26.3.3.7*

Underground tanks that are taken out of service shall be removed or permanently closed in accordance with the applicable requirements of Annex C. [**31**:7.4.7]

26.3.4 Installation of Tanks Inside Buildings.

26.3.4.1

This section shall apply to tanks installed inside buildings, ~~either enclosed or unenclosed~~ whether the building is completely enclosed or not, as herein described.

26.3.4.2

A safety can of less than 6.5 gal (26 L) capacity shall be permitted to be used for temporary fuel storage. It shall comply with UL 30, *Standard for Metal Safety Cans*, or UL 1313, *Standard for Nonmetallic Safety Cans for Petroleum Products*, and shall be specifically approved only for temporary use. [**31**:7.5.2]

26.3.4.3

A supply tank of 60 gal (227 L) or less capacity shall be constructed in accordance with UL 142A, *Standard for Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids*, and shall be specifically approved for permanent or temporary purposes. [**31**:7.5.3]

26.3.4.4

A supply tank that exceeds 60 gal (227 L) capacity shall be installed on the lowest floor (story, cellar, or basement) of a building, except as provided for in 26.3.4.5. [**31**:7.5.4]

26.3.4.5

A maximum of 660 gal (2500 L) of storage tank capacity shall be permitted to be installed on a higher floor, provided that the tank is contained with a liquidtight sill, containment device, or equivalent means having the ability to hold a minimum capacity equal to the largest tank to prevent spilled liquid fuel from leaving the immediate area.

26.3.4.6

A tank of less than 10 gal (38 L) capacity shall not be placed within 2 ft (0.6 m) from any ignition source, either in or external to the appliance being served, nor shall it be placed in a manner such that the temperature of the fuel in the tank exceeds the temperature of its surroundings by 25°F (14°C) or more. [**31**:7.5.6]

26.3.4.7

A tank of capacity between 10 gal and 1320 gal (38 L and 5000 L) shall not be placed within 5 ft (1.5 m) horizontally from any open flame or appliance unless separated from the source of heat by a barrier having a 1-hour fire resistance rating extending horizontally at least 1 ft (0.3 m) past the appliance or the tank, whichever is greater, and extending vertically from floor to ceiling. [**31**:7.5.7]

26.3.4.8

A tank of a capacity between 10 gal and 330 gal (38 L and 1250 L) that is provided with an opening in the bottom for use as a fuel supply connection to an appliance or as a drain shall be arranged as follows:

(1) The tank shall be pitched toward the opening with a slope of not less than ¼ in./ft (20 mm/m).

(2) Each supply line shall be provided with a readily accessible, thermally actuated automatic shutoff valve installed as close as practical to the tank. *(See also 26.4.6.3)*.

(3) A properly sized and rated fuel filter or strainer shall be installed in the fuel supply line to the appliance downstream and within 6 in. (150 mm) of the thermally actuated automatic shutoff valve required by 26.3.4.8(2).

(4) Where three or more tanks are installed as part of a fuel storage system, each appliance supply line shall be provided with its own readily accessible shutoff valve.

(5) A combination valve that functions as a shutoff and a thermally actuated valve that complies with (2) and (4) is acceptable.

26.3.4.9

Each tank shall be equipped with separate fill and vent openings unless connected as shown in Figure 26.4.8.2, Figure 26.4.8.3, and Figure 26.4.8.4.

26.3.4.10

Each tank shall be equipped with a gauging device that indicates full, empty, and a minimum of four equal divisions.

26.3.4.10.1

Where tanks are cross-connected, as shown in Figure 26.4.8.2, Figure 26.4.8.3, and Figure 26.4.8.4, gauges shall only be installed in the vented tank(s). [**31**:7.5.10.1]

26.3.4.11
Any unused opening in a tank shall be closed by a metallic vaportight threaded plug or cap. [**31**:7.5.11]
26.3.4.12
A tank or tank system shall be permitted to supply more than one appliance. [**31**:7.5.12]
26.3.4.13
Where a tank or tank system is not located in a dedicated room or enclosure, the maximum capacity in the building shall not exceed 1320 gal (5000 L), unless the installation meets the criteria in 26.3.4.13.1 or 26.3.4.13.2.
26.3.4.13.1
Fuel tanks of any size shall be permitted within a mechanical room, provided the room is designed using recognized engineering practices with suitable fire detection, fire suppression, and containment means to prevent the spread of fire beyond the room of origin. [**31**:7.5.13.1]
26.3.4.13.2
Where a tank or tank system is not located in a dedicated room or enclosure, but is separated from other tank(s) by construction having a fire resistance rating of at least 2 hours, the maximum capacity in each separate area shall not exceed the quantity specified in 26.3.4.13. The maximum total capacity in the building shall not be limited. [**31**:7.5.13.2]
26.3.4.13.3
Where a tank or tank system is located in a dedicated room or enclosure that is separated from the rest of the building by construction having a fire resistance rating of at least 1 hour, the maximum total capacity in the room shall not exceed 1320 gal (5000 L). [**31**:7.5.13.3]
26.3.4.13.4
Where a tank or tank system is located in a dedicated room or enclosure that is separated from the rest of the building by construction having a fire resistance rating of at least 3 hours, the maximum total capacity in the room shall be permitted to exceed 1320 gal (5000 L) for a nonengineered system. [**31**:7.5.13.4]
26.3.4.13.5
Dedicated rooms or enclosures shall meet all applicable requirements of Section 26.3.5. [**31**:7.5.13.5]
26.3.4.13.6
Tanks shall not obstruct ready access to any utility service meters, electrical panelboards, or shutoff valves. [**31**:7.5.13.6]
26.3.5 Requirements for Dedicated Tank Rooms and Tank Enclosures.
26.3.5.1
Unless otherwise provided with secondary containment, each tank room or tank enclosure shall have a doorway with a noncombustible liquidtight sill or ramp at least 6 in. (150 mm) high and a self-closing, listed fire door that meets the requirements of NFPA 80.
26.3.5.1.1
If the sill or ramp is more than 6 in. (150 mm) high, the walls of the room or enclosure shall be built to withstand the static head that would be expected in event of a fuel spill, up to the height corresponding to the expected spill depth. [**31**:7.6.1.1]
26.3.5.2
Fire doors for rooms or enclosures of 2-hour fire-resistant construction shall have a fire protection rating of 1½ hours. [**31**:7.6.2]
26.3.5.3
Fire doors for rooms or enclosures of 3-hour fire-resistant construction shall have a fire protection rating of at least 3 hours. [**31**:7.6.3]
26.3.5.4
Each tank room or tank enclosure shall be provided with either portable or permanent means to ventilate the room or enclosure prior to its being entered ~~for inspection or repair~~.
26.3.5.5
A tank installed in a room or area having a fire resistance rating of 2 hours or less shall be of such size and shape that it can be installed in and removed from the room or area and from the building as a single unit. [**31**:7.6.5]
26.3.6 Day Tanks.
26.3.6.1
Day tanks shall be used only for connection in the supply line between the main tank and the appliance.
26.3.6.2
Day tanks shall be listed.
26.3.6.3
Day tanks shall be filled by pump transfer through continuous piping from the main supply tank.

26.3.6.4* Day tanks shall have float switches or other means to automatically control oil levels and prevent overfill.

A.26.3.6.4. Other levels may include, but not be limited to, low level or critical high level.
26.3.7 Installation of Outside Aboveground Tanks.
26.3.7.1
This section shall apply to tanks that are installed aboveground outside of buildings.

26.3.7.2
A tank or tanks whose capacity does not exceed 660 gal (2500 L) shall be permitted to be installed outside of and adjacent to a building, provided they are separated from the nearest line of adjoining property by the following minimum distance:

(1) 5 ft (1.5 m) for tanks not exceeding 275 gal (1040 L) capacity

(2) 10 ft (3 m) for tanks greater than 275 gal (1040 L) capacity, but not exceeding 660 gal (2500 L) capacity [**31**:7.8.2]

26.3.7.3
A tank or tanks whose capacity exceeds 660 gal (2500 L) shall be installed in accordance with all applicable requirements of Chapter 22. [**31**:7.8.3]
26.3.7.4*
Outside aboveground tanks and their appurtenances and supports shall be protected from external corrosion by a coating suitable for exterior use. [**31**:7.8.4]

A.26.3.7.4

Primer paints do not qualify as suitable corrosion protection. The asphaltum coating or rust-inhibiting material typically used on outside tanks does meet the intent of this requirement for external corrosion protection [**31**:A.7.8.4]
26.3.7.5
Tanks that are intended for temporary supply to an appliance shall be listed for the intended use.
26.3.7.6
Outside aboveground tanks shall also comply with 26.3.4.8 through 26.3.4.12 and with 26.3.4.13.6. [**31**:7.8.6]
26.3.7.7
When a steel single-wall aboveground tank is fitted with a side outlet or is installed in a top draw configuration, and is located outside, it shall be installed within a secondary containment large enough to contain 110 percent of the tank's content. [**31**:7.8.7]
26.3.8 Tank Heating Systems.
26.3.8.1
Where tanks are provided with heating systems to maintain fuel at the required temperature for proper atomization, the heating systems shall meet the requirements of 26.3.8.2 through 26.3.8.4, as applicable. [**31**:7.9.1]
26.3.8.2*
Where tanks are heated by steam coils, the maximum operating pressure of the steam coils shall not exceed a gauge pressure of 15 psi (gauge pressure of 105 kPa). [**31**:7.9.2]

A.26.3.8.2

Tank heaters connected so that condensate or water is not returned to the boiler are preferred. [**31**:A.7.9.2]
26.3.8.2.1
Where a pressure-reducing valve is used to limit the steam pressure to a gauge pressure of 15 psi (gauge pressure of 105 kPa) or less, the following shall apply:

(1) A relief valve set at not more than a gauge pressure of 5 psi (gauge pressure of 35 kPa) above the normal pressure in the coil shall be provided.

(2) Provision shall be made to limit the steam temperature to 250°F (121°C). [**31**:7.9.2.1]

26.3.8.3
Where tanks are heated by hot water coils, the hot water shall be provided by indirect heaters and the maximum temperature of the water shall be limited to 250°F (121°C). [**31**:7.9.3]
26.3.8.4
Where tanks are heated by electric heaters, the heaters shall be equipped with listed and approved thermostats designed to prevent the fuel from exceeding its minimum flash point. [**31**:7.9.4]
26.3.9 Special Storage Arrangements.
In particular installations, the provisions of Chapter 26 shall be permitted to be altered by the authority having jurisdiction after consideration of special features such as the following:

(1) Topographical conditions, barricades, walls, and proximity to buildings or adjoining property

(2) Height and character of construction and nature of occupancies of such buildings

(3) Capacity and construction of proposed fuel tanks

(4) Characteristics and properties of the combustible liquid fuels to be stored

(5) Degree of private fire protection to be provided

(6) Capability of the fire department to cope with combustible liquid fires [**31**:7.10]

26.3.10 Tank Leakage Testing and Periodic Inspection.

26.3.10.1

Except as provided for in 26.3.10.1, all tanks, whether shop-built or field erected, shall be tested before they are placed in service in accordance with the requirements of the code under which they were built, according to manufacturer's instructions or as per NFPA 30.

26.3.10.1.1
An ASME code stamp or a listing mark acceptable to the authority having jurisdiction shall be evidence of compliance with this test. [**31**:7.11.1.1]

26.3.10.1.2

Each storage tank that has been structurally damaged, repaired, reconstructed, relocated, jacked, or damaged by impact, flood, or other trauma, or is suspected of leaking shall be inspected and tested in accordance with Section 21.5 or in a manner acceptable to the authority having jurisdiction. [**30**:21.8.5].
26.3.10.2
Following completion of a new installation, the tank and its piping shall be inspected for leakage during the initial fill by a qualified technician and, if a leak is found, the tank or piping shall be repaired and retested. [**31**:7.11.2]
26.3.10.3
Each tank shall be periodically inspected by a qualified technician for evidence of leakage and shall be maintained liquidtight. Tanks found to be leaking shall be repaired or replaced. [**31**:7.11.3]
26.3.11 Abandonment and Removal from Service of Tanks and Related Equipment.
Except as provided for in 26.3.11.1, if a tank and its related piping are abandoned for whatever reason, the tank and all piping connected to it, including the outside fill and vent piping and any piping connected to the appliance, shall be emptied of all contents, cleaned, removed from the premises or property, and disposed of in accordance with applicable local, state, and federal rules and regulations. [**31**:7.12]
26.3.11.1
If an appliance is converted to an alternate fuel, but the tank is kept in place so that it can be returned to service at some future date, the following requirements shall be met before the alternate fuel is used:

(1) The entire contents of the tank shall be completely removed and the tank purged of all vapors.

(2) The fuel tank vent line shall remain intact and open.

(3) The outside fill pipe shall be removed and the tank opening shall be capped or plugged or the outside fill pipe shall be capped and filled with concrete, and all remaining piping, other than the vent line, shall be capped or sealed. [**31**:7.12.1]

26.3.12 Fuel Storage Systems That Are Permanently Taken Out of Service.
26.3.12.1
If a fuel storage tank is permanently removed from service for whatever reason, the tank and all piping connected to it, including the outside fill and vent piping and any supply piping connected to the appliance, shall be:

(1) Emptied of all liquid contents and sludge

(2) Cleaned and rendered free of combustible vapors

(3) Removed from the premises or property

(4) Properly disposed of in accordance with all applicable local, state, and federal rules and regulations [**31**:7.13.1]

26.3.12.2
The remover/installer of a tank taken out of service shall submit an affidavit of compliance to the authority having jurisdiction or to the tank owner stating that such fuel storage system was removed, in compliance with this section. [**31**:7.13.2]
26.3.13 Permanent Abandonment of Underground Tanks.
If an underground fuel storage tank is permanently removed from service, the requirements of Annex C shall apply. [**31**:7.14]

26.4 Piping Systems and Components

26.4.1 Acceptable Piping — Types and Materials.

26.4.1.1
Tank fill and vent piping shall be one of the types listed in 26.4.1.1.1 and 26.4.1.1.2.

26.4.1.1.1
For aboveground fill and vent piping, only the following types and materials shall be permitted:

(1) Minimum Schedule 40 steel pipe that complies with either ANSI/ASME B36.10M, *Standard on Welded and Seamless Wrought Steel Pipe*; ASTM A53/A53M, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless;* or ASTM A106/A106M, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service*

(2) Minimum Schedule 40 stainless steel pipe that complies with ASTM A312/A312M, *Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes*

(3) Minimum schedule 10 steel and stainless steel vent piping equal to or greater than 4 inch diameter that complies with the standards listed in (1) and (2) shall be permitted as part of an engineered system.

(4) Other piping that is part of an engineered fuel storage system that is listed to UL 180, *Standard for Combustible Liquid Tank Accessories*, installed in accordance with manufacturer's instructions, and approved by the authority having jurisdiction [**31**:8.2.1.1]

(5) Other piping that is part of an engineered fuel storage system that is listed to UL 1369, *Aboveground Piping for Flammable and Combustible Liquids*, installed in accordance with manufacturer's instructions, and approved by the authority having jurisdiction

(6) Minimum Schedule 40 brass pipe that complies with ASTM B43, *Standard Specification for Seamless Red Brass Pipe, Standard Sizes*

26.4.1.1.2
For underground fill and vent piping, only the following types and materials shall be permitted:

(1) Listed nonmetallic piping that complies with UL 971, *Standard for Nonmetallic Underground Piping for Flammable Liquids*

(2) Listed metallic piping that complies with UL 971A, *Outline of Investigation for Metallic Underground Piping for Flammable Liquids* or UL 180, *Standard for Combustible Liquid Tank Accessories*

(3) Steel pipe that meets 26.4.1.1.1(1) and provided with corrosion protection consistent with NFPA 30 27.6.4.

(4) Brass pipe that meets 26.4.1.1.1(6)

(5) Stainless steel pipe that meets 26.4.1.1.1(2) [**31**:8.2.1.2]

26.4.1.2
Fuel supply lines shall be one of the piping types listed in 26.4.1.2.1 or 26.4.1.2.2.

26.4.1.2.1
For aboveground fuel supply lines, only the following types and materials shall be permitted:

(1) Minimum Schedule 40 steel pipe that complies with ANSI/ASME B36.10M, *Standard on Welded and Seamless Wrought Steel Pipe*; ASTM A53/A53M, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless;* or ASTM A106/A106M, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service*

(a) Galvanized steel pipe shall not be used for supply lines.

(2) Minimum Schedule 40 brass pipe that complies with ASTM B43, *Standard Specification for Seamless Red Brass Pipe, Standard Sizes*

(3) Flexible metal pipe listed to UL 2039, *Standard for Safety for Flexible Connector Piping for Fuels*, and rated for aboveground use, where rigid connections are impractical

(4) Minimum 0.032 in. (0.081 cm) thick copper tubing that complies with ASTM B75/B75M, *Standard Specification for Seamless Copper Tube*; ASTM B88, *Standard Specification for Seamless Copper Water*

Tube; or ASTM B280, *Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service*

(5) Minimum 0.032 in. (0.081 cm) thick brass tubing that complies with ASTM B135/B135M, *Standard Specification for Seamless Brass Tube*

(6) Minimum 0.035 in. (0.089 cm) thick stainless steel tubing that complies with ASTM A254, *Standard Specification for Copper-Brazed Steel Tubing;* or ASTM A269/A269M, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service*

(7) Aboveground fuel supply piping systems listed to UL 180, *Standard for Combustible Liquid Tank Accessories*

(8) Aboveground fuel supply piping systems listed to UL 1369*, Aboveground Piping for Flammable and Combustible Liquids.*

26.4.1.2.2
For underground fuel supply lines and for copper fuel supply lines that are in direct contact with concrete or soil, only the following types and materials shall be permitted:

(1) Listed nonmetallic piping that complies with UL 971, *Standard for Nonmetallic Underground Piping for Flammable Liquids*

(2) Listed corrosion-resistant metallic piping that complies with UL 971A, *Outline of Investigation for Metallic Underground Fuel Pipe*

(3) Flexible metal piping listed to UL 2039, *Standard for Safety for Flexible Connector Piping for Fuels*, and rated for underground use, where rigid connections are impractical

26.4.2 Acceptable Fittings — Types and Materials.

26.4.2.1
Pipe fittings shall be malleable iron, steel, stainless steel, or brass with male or female thread types that comply with a recognized thread specification or be press-connect-type fittings listed to UL 180, *Standard for Combustible Liquid Tank Accessories*. Threads shall be of the type, size, and direction that match with the pipe end threads with which they connect and shall be made liquidtight with suitable pipe joint or sealing compounds. Press-connect fittings shall be installed in accordance with the manufacturer's specifications with a tool recommended by the manufacturer. [**31**:8.3.1]

26.4.2.2

Tubing fittings shall be of types suitable for metal-to-metal flare, press-connect fittings listed to UL 180, *Standard for Combustible Liquid Tank Accessories*, or engineered connections for the metals and thicknesses of the tubing with which they connect. They shall be of the type and size that match with the tube end, flare, engineered fitting, or press-connect end of tubing with which they connect. They shall be connected in accordance with the manufacturer's instructions. [**31**:8.3.2]

26.4.2.3

Fittings that are part of an engineered fuel piping system that is listed to UL 1369, *Aboveground Piping for Flammable and Combustible Liquids*, installed in accordance with manufacturer's instructions, and approved by the authority having jurisdiction

26.4.2.4
Welded or flanged connections shall be permitted.

26.4.2.5

Other fittings and connection types shall be permitted if they are part of an engineered system that is listed for use with liquid fuel and installed in accordance with the manufacturer's instructions. [**31**:8.3.3]

26.4.2.6
Cast iron fittings shall not be used. [**31**:8.3.4]

26.4.3 Piping System Design.

26.4.3.1

Piping systems shall be:

(1) Liquidtight

(2) Physically supported in accordance with recognized industry standards, codes, or manufacturer's installation instructions.

(3) Protected against physical damage

(4) Installed with seismic accommodation when required.

26.4.3.2
Allowances shall be made for expansion, contraction, jarring, and vibration of piping systems. [**31**:8.4.2]

26.4.3.3
Piping systems made of combustible materials shall not be used inside of buildings or aboveground outside of buildings unless listed with at least a 30-minute fire rating, in accordance with UL 180, *Standard for Combustible Liquid Tank Accessories* or UL 1369, *Aboveground Piping for Flammable and Combustible Liquids* [**30**:8.4.3]

26.4.3.4
Piping systems for underground tanks shall be provided with accommodation for ground movement without impairing the tightness of the piping system.

26.4.3.5
All connections to an underground tank shall be made through the top of the tank. [**31**:8.4.5]

26.4.3.6
Fuel shall not be transferred through piping to appliances by pressurization of the tank. [**31**:8.4.6]

26.4.3.7
Each tank or tank system shall be equipped with separate fill and vent pipes, both of which shall terminate aboveground outside the building, except as permitted for cross-connected tanks in 26.4.8.

26.4.3.7.1
The fill pipe for each tank shall be provided on an exterior wall of the room or structure enclosing the tank at a point at least 600 mm (24 in.) from any building opening at the same or lower level. [**37**:6.6.3.3]

26.4.3.7.2 Tanks shall be filled in a manner that prevents spills when the filing hose is disconnected.

26.4.3.7.3

A fill pipe terminating in accordance with 26.4.3.7.1 shall not be required for tanks that are filled manually at the fill connection on the tank, provided that the tank and its fill connection are located within the spill containment required by 26.4.3.7.3 and the filling operation is constantly attended. [**37**:6.6.3.4]

26.4.3.7.4

Each tank room shall be provided with spill containment consisting of either a wall, a curb, or a dike having a capacity at least equal to that of the largest tank.

Exception No. 1: A spill containment system of lesser capacity equipped with an overflow or drainage system that is adequate in size and location to convey any spillage of fuel to a tank (inside or outside) or to a safe area outside the structure.

Exception No. 2: Listed or approved secondary containment tanks shall be considered as meeting this requirement provided piping between fuel tank(s) and engine(s) is double-wall and protected from physical damage. [**37**:6.3.6.3]

26.4.4 Tank Fill Piping.

26.4.4.1
The fill pipe as permitted in 26.4.1.1 connected to the tank shall be large enough and so located as to permit ready filling in a manner that minimizes spills. The fill pipe shall also be:

(1) At least 1¼ in. (30 mm) nominal pipe size

(2) Pitched toward the tank

(3) Protected from physical damage

(4) Without sags or traps where liquid can collect [**31**:8.5.1]

26.4.4.2
The end of an aboveground fill pipe shall be secured with a metal cover designed to prevent the entry of water and shall be identified as a fuel fill opening.

26.4.5 Tank Vent Piping.

26.4.5.1
Vent piping connected to a tank as permitted in 26.4.1.1 shall be large enough and so located as to permit adequate normal fill and emergency venting. The vent pipe shall also be:

(1) Sized for the tank capacity in accordance with Table 26.3.1.5.1 or as required by the listing or manufacturer.

(2) Pitched toward the tank

(3) Protected from physical damage

(4) Without sags or traps where liquid can collect

(5) Without obstructions other than an audible alarm at the tank opening or a cable operated tank gauge that does not restrict the vent. [**31**:8.6.1]

26.4.5.2
All vent pipes shall terminate outside of buildings at a point not less than 2 ft (0.6 m) from any building opening. [**31**:8.6.2]

26.4.5.2.1 Indoor venting shall only be allowed if approved.

26.4.5.2.2 Vent outlets shall be located so that vapors will not be trapped by eaves or other obstructions.

26.4.5.2.3*
Vent pipes shall terminate in a manner to avoid being obstructed by snow, ice, and water.

A.26.4.5.2.3 This protection is often accomplished by installing the vent termination above known flood and snowfall levels.

26.4.5.2.4
Vent pipes shall terminate not more than 12 ft (3.6 m) from the fill pipe and at a point visible from the fill point. [**31**:8.6.2.2]

26.4.5.2.~~3~~5

The requirements of 26.4.5.2.3 shall not be required if:

(1) a gauge is located within sight of the operator and,
(2) a high-level alarm is used that can be heard by the operator.

26.4.5.3
The vent pipe shall terminate in a corrosion-resistant weatherproof vent cap. [**31**:8.6.3]

26.4.5.4
Vent caps shall have a minimum free open area equal to the cross-sectional area of the vent pipe and shall have screens No. 4 mesh or coarser. [**31**:8.6.4]

26.4.6 Fuel Supply Piping and Return Piping.
26.4.6.1
The fuel supply piping between the supply tank and the appliance shall be:

(1) At least nominal 3/8 in. (10 mm) pipe or tubing

(2) Large enough to meet the fuel consumption rate of the appliance

(3) Provided with a shutoff valve at the outlet, for an aboveground tank

(4) Provided with a shutoff valve where the fuel line enters a building [**31**:8.7.1]

(5)* Provided with a fusible link safety valve where an oil line enters the building

A.26.4.6.1(5) The fusible link safety shutoff valve can include the shutoff valve function required in 26.4.6.1(4).

26.4.6.2*
The fuel supply piping from the supply tank shall be connected to the top of the tank, except in the following cases:

(1) Tanks of 330 gal (1250 L) or less

(2) Tanks with cross-connections [**31**:8.7.2]

A. 26.4.6.2
Connecting fuel supply piping to the top of all supply tanks (top-draw connection) can increase the risk of water accumulation within the tank. If water is left in the tank, it could be at risk of premature failure due to internal corrosion. It is, therefore, recommended to properly maintain a top-draw tank by sloping the tank in accordance with 26.3.4.8(1) and 26.3.7.6 and adhering to the manufacturer's instructions for installation and maintenance. As a best practice for tank maintenance, the lowest point of the tank should be inspected for presence of water accumulation at least once per year and all water removed as soon as detected. [**31**:A.8.7.2]

26.4.6.3
A readily accessible fusible link safety shutoff valve shall be installed:

(1) As close as practical to the burner(s) supply connection

(2) Immediately upstream of the filter and inside the building, if the piping passes through a foundation [**31**:8.7.3]

26.4.6.4
The pressure at the fuel supply inlet to appliance shall not exceed a gauge pressure of 3 psi (gauge pressure of 21 kPa) unless the appliance is approved for a higher inlet pressure. [**31**:8.7.4]

26.4.6.5
Threaded pipe or valve ends installed in a tank bottom opening for gravity feed shall not penetrate above the bottom of the tank shell. [**31**:8.7.5]

26.4.6.5.1
Use of stem pieces or other modifications to valves shall not circumvent the requirement of 26.4.6.5 to prevent water in the tank from draining out of the bottom opening. [**31**:8.7.5.1]

26.4.6.6
Unions or fittings that require gaskets or packings used in fuel lines shall be listed to UL 180, *Standard for Combustible Liquid Tank Accessories*. [**31**:8.7.6]

26.4.6.7 Fuel Return Piping.
A return line from the appliance back to a supply tank shall have no valves or obstructions except for a hard-seat or ball valve that shall be left in the open position, with the handle removed, and shall enter the top of the same tank. [**31**:8.7.7]

26.4.7 Auxiliary Tank Piping.
26.4.7.1
An auxiliary tank shall be provided with an overflow pipe draining to the supply tank and extending into the top of the supply tank, unless the auxiliary tank is specifically listed for use without an overflow pipe. [**31**:8.8.1]

26.4.7.1.1 If a gravity flow from the auxiliary tank to the supply tank is not possible, a return pump, automatically actuated at no higher than 95% of the auxiliary tank's capacity, shall be permitted to be used.

26.4.7.2
An overflow pipe from an auxiliary tank shall have no valves or obstructions except for a hard-seat or ball valve that shall be left in the open position, with the handle removed, and shall enter the top of the same tank.

26.4.8 Piping for Cross-Connected Tanks.

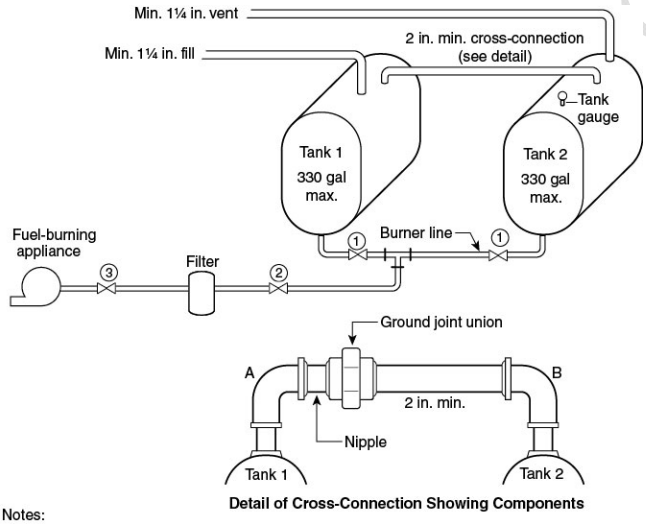
26.4.8.1 Cross connected tanks shall all be of the same size and shape and installed at the same elevations to prevent overfilling.

26.4.8.1.1 Tanks of different capacities shall be permitted provided that the top and bottom elevations are the same for all connected tanks.

26.4.8.2
Cross-connection of two tanks of not more than 660 gal (2500 L) aggregate capacity shall be permitted if piped in accordance with Figure 26.4.8.2. [**31**:8.9.1]

Figure 26.4.8.2 Cross-Connection of Two Fuel Tanks of Not More Than 660 gal (2500 L) Aggregate Capacity. [31: Figure 8.9.1]

Commented [MM1]: Figures to be updated once requirements are agreed upon.



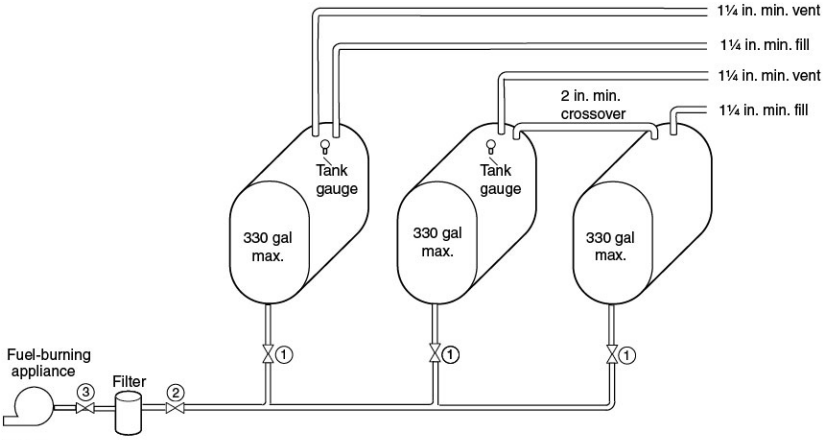
Detail of Cross-Connection Showing Components

Notes:
① Fusible link safety shutoff valve required by 8.7.1.3.
② Fusible link safety shutoff valve required by 8.10.6(1).
③ Fusible link safety shutoff valve required by 8.10.6(2).
For SI units, 1 gal = 3.785 L, 1 in. = 25 mm.

26.4.8.3
Cross-connection of three tanks of not more than 990 gal (3750 L) aggregate capacity to the same appliance shall be permitted if piped in accordance with Figure 26.4.8.3. [**31**:8.9.2]

Figure 26.4.8.3 Cross-Connection of Three Fuel Tanks of Not More Than 990 gal (3750 L) Aggregate Capacity. [31: Figure 8.9.2]

Commented [MM2]: Figures to be updated once requirements are agreed upon.

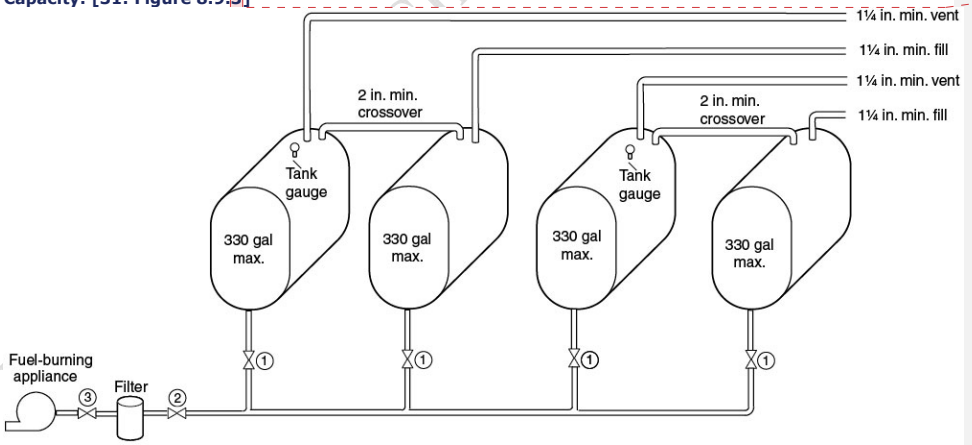


Notes:
① Fusible link safety shutoff valve required by 8.7.1.3.
② Fusible link safety shutoff valve required by 8.10.6(1).
③ Fusible link safety shutoff valve required by 8.10.6(2).
For SI units, 1 gal = 3.785 L, 1 in. = 25 mm.

26.4.8.4
Cross-connection of four tanks of not more than 1320 gal (5000 L) aggregate capacity to the appliance shall be permitted if piped in accordance with Figure 26.4.8.4. [**31**:8.9.3]

Figure 26.4.8.4 Cross-Connection of Four Fuel Tanks of Not More Than 1320 gal (5000 L) Aggregate Capacity. [31: Figure 8.9.3]

Commented [MM3]: Figures to be updated once requirements are agreed upon.



Notes:
① Fusible link safety shutoff valve required by 8.7.1.3.
② Fusible link safety shutoff valve required by 8.10.6(1).
③ Fusible link safety shutoff valve required by 8.10.6(2).
For SI units, 1 gal = 3.785 L, 1 in. = 25 mm.

26.4.8.5
Cross-connection of multiple tanks to the same appliance or to the same group of appliances using single fill and vent pipes shall be permitted in accordance with 26.4.8.2, 26.4.8.3, or 26.4.8.4, provided the tanks are rigidly secured to a common slab or foundation. [**31**:8.9.4]

26.4.8.6
All fill and vent pipes shall drain toward the tank. [**31**:8.9.5]

26.4.8.7
Vent pipes from more than one tank shall be permitted to be manifolded and connected into one outlet pipe. [**31**:8.9.6]

26.4.8.7.1
The outlet pipe shall be at least one pipe size larger than the largest individual vent pipe as specified in Table 26.3.1.5.1 or as required by the listing of the tank and the manufacturer's instructions.
26.4.8.7.2
In no case shall the point of connection between two or more vent pipes be lower than the top of the fill pipe opening located on the tank. [**31**:8.9.6.2]

26.4.8.7.3 Emergency vents shall be sized and installed in accordance with 27.8.1.6.

26.4.9 Pumps, Valves, Gauges, and Appurtenances.

26.4.9.1
Tanks, including each compartment of multi-compartment tanks shall be equipped with a method of determining the fuel level. [**31**:8.10.1]

26.4.9.2
Gauges for indicating the oil level in tank(s) shall be listed in accordance with UL 180, *Standard for Combustible Liquid Tank Accessories*. They shall be installed in accordance with manufacturers' instructions and so that fuel or vapor will not be discharged into the building. [**31**:8.10.2]

26.4.9.3
Except as provided for in 26.4.9.3.1 and 26.4.9.3.2, supply tanks provided with fill and vent pipes shall be provided with a device to indicate either visually or audibly and within 12 ft (3.5 m) of the fill point, as specified by 26.4.5.2.3, when the fuel in the tank has reached a predetermined safe level. [**31**:8.10.3]

26.4.9.3.1
Aboveground tanks that do not exceed 330 gal (1250 L) capacity shall rely on only an audible fill alarm to determine safe fill levels. [**31**:8.10.3.1]

26.4.9.4
Supply tanks shall not be equipped with a sight gauge. [**31**:8.10.4]

26.4.9.5
An automatic pump that is not an integral part of an appliance shall be listed or otherwise approved for use with fuel oil and installed in full compliance with its listing if listed, and the manufacturer's requirements.
26.4.9.6 Fusible Link Safety Shutoff Valve.
26.4.9.6.1
A readily accessible fusible link safety shutoff valve that closes against the supply pressure shall be installed at each of the following points, except as provided in 26.4.9.6.2:

(1) As close as practical to the filter on the tank side of the filter

(2) As close as practical to the inlet connection to the appliance [**31**:8.10.6.1]

(3) Where the supply pipe enters the building unless prohibited by other standards

26.4.9.6.2
Where the filter and inlet connection to appliance are within 18 in. (457 mm) of each other, only one fusible link safety shutoff valve shall be required to be installed on the tank side of the filter. [**31**:8.10.6.2]

26.4.10 Testing of Fuel Supply and Return Piping.

26.4.10.1

Unless fuel supply and return piping and all fittings are visible for inspection, they shall be tested for leaks by either a pressure test method in accordance with 26.4.10.3 or a vacuum test method in accordance with 26.4.10.4 before being covered, enclosed, or placed into service. [**31**:8.11.1]

26.4.10.2
Before oil supply lines are tested for leaks, any supply tank and any appliances shall be isolated from pressure, unless rated for the applicable test pressure or vacuum. [**31**:8.11.2]

26.4.10.3
Pressure testing for leakage shall be conducted with air or an inert gas and shall be held for a time sufficient to conduct a complete visual inspection of all piping and fittings, but in no case for less than 10 minutes after stabilization. [**31**:8.11.3]

26.4.10.3.1
A gauge pressure of at least 5.0 psi (35 kPa), but not more than 10 psi (70 kPa), shall be applied to all portions of the supply piping to be evaluated. [**31**:8.11.3.1]

26.4.10.3.2
Leakage shall be detected by the appearance of bubbles after a soap-and-water solution or an equivalent leak detection fluid has been applied onto all joints.

26.4.10.4
Vacuum testing for leakage shall be conducted with a vacuum pump and vacuum gauge with 0.5 in. Hg (12 mm Hg) increments and accuracy of at least 2 percent. Vacuum shall be held for at least 30 minutes after stabilization with no loss. [**31**:8.11.4]

26.4.10.4.1
A vacuum of at least 20 in. Hg (500 mm Hg) shall be applied to all portions of the supply piping to be evaluated. [**31**:8.11.4.1]

26.4.10.4.2
Leakage shall be determined by any loss of vacuum after the test time. [**31**:8.11.4.2]

26.4.10.5
Gauges used for leak testing shall be suitable for the test type, shall be in working order, and shall be calibrated. Gauges shall have a test range of not more than twice the test pressure and shall indicate in increments of not more than 1.0 psi (7 kPa) or 1.0 in. Hg (25 mm Hg). [**31**:8.11.5]

Public Input No. 126-NFPA 30-2021 [Section No. A.21.4.2.1.1]

A.21.4.2.1.1

Atmospheric tanks include tanks of compartmented design and tanks that incorporate secondary containment.

UL142A, *Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids*, covers shop-fabricated steel special-purpose generator base, work bench, lube oil, used oil, process and day-tank types.

Statement of Problem and Substantiation for Public Input

Recent UL 142A revisions added a new “Process Tank” type that needs to be reflected in the Appendix material.

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