Second Revision No. 3-NFPA 30-2013 [ New Section after 17.3.1 ]

17.3.1.1  Permanent process plant buildings shall be located in accordance with the requirements of API RP 752, Management of Hazards Associated with Location of Process Plant Buildings.

17.3.1.2  Portable process plant buildings shall be located in accordance with the requirements of API RP 753, Management of Hazards Associated with Location of Process Plant Portable Buildings.

Submitter Information Verification

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Submittal Date: Mon Jun 24 08:23:35 EDT 2013

Committee Statement

Committee Statement: Second Revision No. 3 incorporates the intent of Public Comment No. 3 to reference the American Petroleum Institute’s Recommended Practices RP 752 and RP 753. The NFPA 30 Technical Committee on Operations determined that these two documents are specific to process buildings and are more appropriately located in Section 17.3.
17.4.3*
The minimum distance of a processing vessel to a property line that is or can be built upon, including the opposite side of a public way; to the nearest side of a public way; or to the nearest important building on the same property shall be determined by one of the following:

1. In accordance with Table 17.4.3
2. Determined by In accordance with an engineering evaluation of the process, followed by application of sound fire protection and process engineering principles

Table 17.4.3 Location of Process Vessels with Respect to Property Lines, Public Ways, and the Nearest Important Building on the Same Property — Protection for Exposures Is Provided

<table>
<thead>
<tr>
<th>Vessel Maximum Operating Liquid Capacity (gal)</th>
<th>Stable Liquid Emergency Relief*</th>
<th>Unstable Liquid Emergency Relief*</th>
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</tr>
</thead>
<tbody>
<tr>
<td>From Property Line that Is or Can Be Built upon, Including Opposite Side of Public Way</td>
<td>From Nearest Side of Any Public Way or from Nearest Important Building on Same Property that Is Not an Integral Part of the Process</td>
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<td>Over</td>
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<td>Over</td>
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</tr>
<tr>
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<td>45</td>
</tr>
<tr>
<td>276 to 750</td>
<td>10</td>
<td>45</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>751 to 12,000</td>
<td>15</td>
<td>50</td>
<td>25</td>
<td>60</td>
</tr>
<tr>
<td>12,001 to 30,000</td>
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<td>50</td>
<td>30</td>
<td>80</td>
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<tr>
<td>30,001 to 50,000</td>
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<td>75</td>
<td>45</td>
<td>120</td>
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<tr>
<td>50,001 to 100,000</td>
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<td>125</td>
<td>75</td>
<td>200</td>
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<tr>
<td>Over 100,000</td>
<td>80</td>
<td>200</td>
<td>120</td>
<td>300</td>
</tr>
</tbody>
</table>

For SI units, 1 gal = 3.8 L; 1 ft = 0.3 m; 1 psi = a gauge pressure of 6.9 kPa.

Note: Double all of above distances where protection for exposures is not provided.

*Gauge pressure.

17.4.3.1
Processing vessels used solely to process stable Class IIIIB liquids shall be located in accordance with Table 22.4.1.6.

Supplemental Information

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Submitter Information Verification

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Submittal Date: Mon Jun 24 08:37:58 EDT 2013

Committee Statement

Committee Statement: Second Revision No. 4 addresses Committee Input No. 21 and Recommendation 2010-10-I-OH of the U. S. Chemical Safety and Hazard Investigation Board, which was submitted to NFPA as a consequence of the Board's investigation of the May 4, 2009 explosion and fire at Veolia Environmental Services, West Carrollton OH. See also Second Revision No. 3. The NFPA 30 Technical Committee on Operations has made adjustments to Table 17.4.3 that significantly increase certain of the required separation distances for process vessels.

Response Message:
Table 17.4.3 Location of Process Vessels with Respect to Property Lines, Public Ways, and the Nearest Important Building on the Same Property — Protection for Exposures Is Provided

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<td>120</td>
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For SI units, 1 gal = 3.8 L; 1 ft = 0.3 m; 1 psi = a gauge pressure of 6.9 kPa.

Note: Double all of above distances where protection for exposures is not provided.

*Gauge pressure.
Table 17.4.3 Location of Process Vessels with Respect to Property Lines, Public Ways, and the Nearest Important Building on the Same Property — Protection for Exposures Is Provided

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For SI units, 1 gal = 3.8 L; 1 ft = 0.3 m; 1 psi = a gauge pressure of 6.9 kPa.

Note: Double all of above distances where protection for exposures is not provided.

*Gauge pressure.
A.17.4.3
Minimum distances provided in Table 17.4.3 are extracts from similar tables in Chapter 22. Process vessels are at greater risk of upset and experience a wider range of process parameters (e.g., flow, temperature, pressure, level, reactivity, vapor density, and potential for vapors to reach ignition sources if released) when compared to storage tanks. Evaluations for minimum distance should take these factors into account and establish the “stability” of the material and the maximum pressure in the vessel(s), taking into consideration credible process deviations and the design and reliability of safeguards that prevent or control process upsets. Minimum distances to property lines, important buildings, and public ways should consider the risk (i.e., likelihood and consequence) to persons, property, and adjacent processes and storage from vapor cloud ignition, blast overpressure, and thermal flux (i.e., burn injury and adjacent structure fire). See also 17.15.3.

Additional guidance can be found in the following documents:
(1) NFPA 497, Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
(2) NFPA 551, Guide for the Evaluation of Fire Risk Assessments
(3) AIChE Guidelines for Evaluating Process Plant Buildings for External Explosions and Fires
(4) AIChE Guidelines for Facility Siting and Layout
(5) AIChE Guidelines for Vapor Cloud Explosion, Pressure Vessel Burst, BLEVE and Flash Fire Hazards
(6) SFPE Handbook of Fire Protection Engineering
(7) SFPE Engineering Standard on Calculating Fire Exposures to Structures
(8) SFPE Engineering Guide: Predicting 1st and 2nd Degree Skin Burns from Thermal Radiation
(9) SFPE Engineering Guide to Fire Exposures to Structural Elements
(10) SFPE Engineering Guide: Assessing Flame Radiation to External Targets from Pool Fires
(11) API RP 500, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
(12) ANSI/API RP505, Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1 and Zone 2
(13) API RP752, Management of Hazards Associated with Location of Process Plant Buildings
(14) API RP753, Management of Hazards Associated with Location of Process Plant Portable Buildings
18.4.4 Transfer of liquids among vessels, containers, tanks, and piping systems by means of air or inert gas pressure shall be permitted only under all of the following conditions:

1. The vessels, containers, tanks, and piping systems shall be designed for such pressurized transfer and shall be capable of withstanding the anticipated operating pressure.
2. Safety and operating controls, including pressure-relief devices, shall be provided to prevent overpressure of any part of the system.
3. Only inert gas shall be used to transfer Class I liquids. Only inert gas shall be used to transfer Class II and Class III liquids that are heated above their flash points.

18.4.4.1 Dispensing of Class I liquids from a container by means of air shall be permitted under the following conditions:

1. The pressure shall be generated by means of a listed hand-operated device.
2. Pressure shall not exceed a gauge pressure of 6 psi (41 kPa) and pressure relief shall be provided.
3. The container shall not exceed 119 gal (450 L) and shall be capable of withstanding the maximum pressure generated by the device.
4. The device shall be bonded and grounded or shall be demonstrated as not being capable of generating a static charge under any operating condition.
5. The device shall be constructed of material compatible with the liquid dispensed.

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Committee Statement
Committee Statement: The NFPA 30 Technical Committee on Operations has reviewed the information that has been submitted to it in support of Public Comment No. 11 and has developed language that is appropriate to ensure safe use of such hand-operated devices for dispensing Class I liquids using air pressure.

Response Message: Public Comment No. 11-NFPA 30-2013 [Section No. 18.4.4]
19.2 Definitions Specific to Chapter 19. (Reserved)

19.2.1* Cooking Oil.
Where used in this chapter, cooking oil shall be classified as a Class IIIB combustible liquid. This definition shall apply to both fresh, or new, cooking oil and waste, or used, cooking oil.

Supplemental Information

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Submitter Information Verification

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Submittal Date: Mon Jun 24 10:19:59 EDT 2013

Committee Statement

Committee Statement: Second Revision No. 9 is a companion to Second Revision No. 7 and defines cooking oil as limited to Class IIIB liquids.  
Response Message:  

Cooking oil is a Class IIIB liquid with a high flash point typically above 500°F (260°C). Because of its high flash point, cooking oil represents a lower fire hazard than Class IIIB liquids having flash points lower than 500°F (260°C). Fresh, or new, cooking oil is supplied to the user for cooking operations. As the oil becomes degraded through repeated use, it must be replaced with fresh oil. This waste, or used, cooking oil is recovered from the cooking appliance and temporarily stored for offsite removal. To maintain fluidity in the transfer process, the waste oil is heated to approximately 100°F (38°C), well below the flash point temperature.
19.7 Cooking Oil Storage Tank Systems in Commercial Kitchens.

19.7.1 Scope.

19.7.1.1 This section shall apply to storage tank systems for cooking oil, as defined in 19.2.1, located in commercial kitchens where tank capacities are greater than 60 gal (227 L).

19.7.1.2 This section shall apply to both fresh and waste cooking oil storage tank systems.

19.7.1.3* Where there are conflicts between the requirements of this section and requirements of other sections of this code, the requirements of this section shall take precedence.

19.7.2 Design and Construction of Cooking Oil Storage Tanks.

19.7.2.1 Materials of Construction.

19.7.2.1.1 Tanks and their appurtenances shall be constructed of materials compatible with cooking oil.

19.7.2.1.2* For tanks storing waste cooking oil, the tanks and their appurtenances shall be constructed of materials compatible with cooking oil at a minimum temperature of 140°F (60°C) continuous and 235°F (113°C) intermittent.

19.7.2.2 Design Standards.

19.7.2.2.1* Metallic cooking oil storage tanks shall be listed in accordance with ANSI/UL 142, Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, or ANSI/UL 80, Standard for Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids.

19.7.2.2.2 Nonmetallic cooking oil storage tanks shall meet the following requirements:

(1) Tanks shall be listed for use with cooking oil, unless otherwise approved.

(2) Tanks shall not exceed 200 gal (757 L) per tank.

19.7.2.3 Normal Venting.

19.7.2.3.1 The normal vent(s) shall be located above the maximum normal liquid level.

19.7.2.3.2 The normal vent shall be at least as large as the largest filling or withdrawal connection.
Where used, normal vents, including vent piping, that are smaller than 1.25 in. (32 mm) nominal inside diameter shall be tested to verify that internal tank pressures will remain below a gauge pressure of 0.5 psi (3.5 kPa) under maximum expected flow rates for tank filling and withdrawal. These tests shall be permitted to be conducted by a qualified outside agency or by the manufacturer, if certified by a qualified observer.

19.7.2.3.4* Normal vents shall be permitted to discharge inside the building.

19.7.2.4 Emergency Venting.

19.7.2.4.1 Cooking oil storage tanks shall be provided with emergency relief venting in accordance with Chapter 22.

19.7.2.4.2 For nonmetallic cooking oil storage tanks, emergency relief venting by form of construction shall be permitted. This shall include the low melting point of the material of construction of the tank.

19.7.2.4.3 For metallic cooking oil storage tanks, emergency relief venting by form of construction shall be prohibited.

19.7.2.4.4 Emergency vents shall be permitted to discharge inside the building.

19.7.2.5* Prevention of Overfilling of Cooking Oil Storage Tanks.

Every cooking oil storage tank shall be provided with means to prevent an accidental overfill. Such means shall be automatic and fail-safe in nature.

19.7.2.6 Tank Heating.

19.7.2.6.1* Electrical equipment used for heating cooking oil shall be listed to ANSI/UL 499, Standard for Electrical Heating Appliances, and shall comply with NFPA 70, National Electrical Code.

19.7.2.6.2* Electrical equipment used for heating cooking oil shall comply with NFPA 70, National Electrical Code, and shall be equipped with automatic means to limit the temperature of the oil to less than 140°F (60°C).

19.7.2.6.3 Use of electrical immersion heaters in nonmetallic tanks shall be prohibited.

19.7.3 Tank Installation and Testing.

19.7.3.1 Location of Cooking Oil Storage Tanks.

Tanks shall be installed in locations appropriate for storage of foodstuffs or inventory and shall not be installed in areas designated as cooking areas.

19.7.3.1.1* Tanks shall be spaced at least 3 ft (0.9 m) away from any cooking appliance or any surface heated to a temperature above 140°F (60°C) continuous and at least 6 ft (1.8 m) away from any open flame.

19.7.3.1.2* Tanks shall not be installed under commercial kitchen ventilation hoods.

19.7.3.1.3 Tanks shall not be required to be separated from one another.

19.7.3.2 Foundations for and Anchoring of Cooking Oil Storage Tanks.

19.7.3.2.1 Tank supports shall be secured to the tank and to the floor to prevent the tank from tipping over. For a flat-bottom tank resting directly on the floor, the tank shall be secured to the floor to prevent the tank from tipping over.
In areas subject to earthquakes, tank supports, the foundation, and anchoring shall meet the requirements of the applicable building code for the specific seismic zone. Engineering evaluation by a qualified, impartial outside agency shall be an acceptable method of meeting this requirement.

19.7.3.2.3
Where a tank is located in areas subject to flooding, the method for anchoring the tank to the floor shall be capable of preventing the tank, either full or empty, from floating during a rise in water level up to the established maximum flood stage. Engineering evaluation by a qualified, impartial outside agency shall be an acceptable method of meeting this requirement.

19.7.3.3  Tank Openings Other than Vents.
19.7.3.3.1
Each connection to the tank below the normal liquid level through which liquid can normally flow shall be provided with an internal or external valve located as close as possible to the shell of the tank, in accordance with Chapter 22.

19.7.3.3.2*
Connections to the tank above the normal liquid level through which liquid can normally flow shall not be required to have a valve, provided there exists a liquidtight closure at the opposite end of the line. The liquidtight closure shall be in the form of a valve, a plug, or a coupling or fitting with positive shutoff.

19.7.3.4  Field Testing.
19.7.3.4.1*
As an alternate method to the testing requirements in Chapter 21, cooking oil storage tanks shall be tested for leaks at the time of installation by filling the tank with cooking oil to a liquid level above the highest tank seam or connection within the normal liquid level. Before the tank is placed in service, all leaks shall be corrected in an approved manner or the tank shall be replaced.

19.7.3.4.2
An approved listing mark on a cooking oil storage tank shall be considered to be evidence of compliance with tank testing requirements.

19.7.4  Fire Protection for Cooking Oil Storage Tanks.
19.7.4.1  Identification for Emergency Responders.
A sign or marking that meets the requirements of NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, or another approved system, shall be applied to each cooking oil storage tank in accordance with Chapter 21. Additional signage shall be applied to each tank identifying the contents of the tank as cooking oil, either fresh or waste.

19.7.4.2
In areas where tanks are located, no additional ventilation shall be required beyond that necessary for comfort ventilation, provided that all cooking equipment is equipped with exhaust systems in accordance with NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.

19.7.4.3
If ventilation is not provided as specified in 19.7.4.2, then the tank shall be vented to another room inside the building that meets these requirements, or the tank shall be vented to the outside of the building.

19.7.5  Transfer Lines.
19.7.5.1*  Design and Construction of Fresh Cooking Oil Transfer Lines.
Transfer lines for fresh cooking oil shall be permitted to be constructed of metallic or nonmetallic materials that are compatible with cooking oil and food products. Nonmetallic transfer lines shall also meet the following requirements:

1 Transfer lines in pressure applications shall be rated for a working gauge pressure of 100 psi (689 kPa) at 70°F (21°C) or the maximum output pressure of the transfer pump, whichever is higher.
(2) Transfer lines in suction applications shall be rated for full vacuum at 70°F (21°C).

(3) Transfer lines shall be rated for temperatures up to 120°F (49°C) continuous.

(4) The maximum nominal inside diameter shall be no larger than 1.25 in. (32 mm).

(5) Leakage shall be controlled through the use of check valves or antisiphon valves at points where the lines connect to the fresh oil tank.

19.7.5.2* Design and Construction of Waste Cooking Oil Transfer Lines.
Waste cooking oil transfer lines shall be permitted to be constructed of metallic or nonmetallic materials that are compatible with cooking oil.

19.7.5.2.1 Transfer lines shall be rated for use with cooking oil at elevated temperatures of 275°F (135°C) continuous and 350°F (177°C) intermittent.

19.7.5.2.2 Nonmetallic transfer lines shall be rated for working pressures up to 250 psi (1724 kPa) at 275°F (135°C).

19.7.5.3 Flow Control.
Cooking oil transfer lines shall be equipped with means to prevent unintended transfer or dispensing of cooking oil. These means shall be permitted to be in the form of momentary control switches, valves, check valves, antisiphon valves, plugs, couplings, fittings, or any combination thereof that are fail-safe in nature.

19.7.5.4 Pressure Control.
Pumping systems used to transfer cooking oil shall have means to prevent overpressurization of transfer lines. These means shall be in the form of relief valves, bypass valves, pressure sensor devices, or the pressure limitation of the pump itself.

19.7.5.5 Installation of Cooking Oil Transfer Lines in Plenum-rated Spaces.
Cooking oil transfer lines installed in plenum-rated spaces shall be enclosed in noncombustible raceways or enclosures, or shall be covered with a material listed and labeled for installation within a plenum.

19.7.5.6 Testing of Cooking Oil Transfer Lines.
Cooking oil transfer lines shall be tested after installation and prior to use. Testing shall be with cooking oil at the normal operating pressures. Any leaks discovered in transfer lines as a result of testing shall be repaired or the transfer lines replaced prior to placing the transfer lines into service.
A.19.7.1.3
The goal of Section 19.7 is to consolidate in one location all requirements for commercial kitchen cooking oil storage and operations. There are a number of chapters in NFPA 30 that apply to these systems, including chapters on storage tanks and piping systems, transferring and dispensing of liquids, and so forth. Many of these requirements are more applicable to industrial or process situations and commercial kitchen cooking oil storage and use was not anticipated. All applicable chapters have been assessed in detail. Those specific requirements in this section that are in potential conflict with other sections of this code have been identified, and alternate methods or exceptions have been developed where appropriate. This approach eliminates the need to add exceptions throughout the existing code, improving ease of use particularly for fire officials.

A.19.7.2.1.2
Waste oil is drained from commercial cooking equipment via a transfer pump and transfer lines to a waste oil storage tank. The oil might be as hot as 375°F (190°C), still well below the oil's flash point. Experience shows that the oil loses significant heat in the transfer process. The maximum temperature of waste cooking oil entering the storage tank is typically below 235°F (113°C). The storage tank should be constructed of materials compatible with cooking oil in that temperature range.

A.19.7.2.2.1
Existing steel tanks listed for flammable and combustible liquids are considered acceptable for waste oil use. These tank standards contain design and construction requirements that would not meet food code requirements, making the tanks unacceptable for storage of liquid food products (i.e., fresh cooking oil).

A.19.7.2.3.4
High flash point cooking oils do not create ignitable vapors when stored under the conditions specified in Section 19.7.

A.19.7.2.4.2
Nonmetallic tanks will melt above the liquid level as an external exposure fire progresses, venting the vapor space of the tank.

A19.7.2.5
Although generally not required for tanks storing Class IIIB liquids, overfill protection is considered necessary for cooking oil storage tanks to prevent inadvertent spillage.

A.19.7.2.6.1
The prohibition of electrical immersion heaters in nonmetallic tanks eliminates a primary ignition source for the oil stored in the tank.

A.19.7.2.6.2
The temperature limitation of 140°F (60 °C) corresponds to ASTM C 1055 (ISO 13732-1) restrictions for maximum allowable temperatures of nonmetallic industrial surfaces for human contact.

A.19.7.3.1.1
The kitchen cooking area has historically been an area where fires occur. Tanks should, therefore, be located away from the kitchen cooking area.

A.19.7.3.1.2
The area beneath the ventilation hood is another area of potential accidental ignition.

A19.7.3.2
An example of a fitting with a positive shutoff is a spring-loaded check valve or a hydraulic quick-coupling with a spring-loaded poppet.

A.19.7.3.4.1
Cooking oil storage tanks are atmospheric tanks with open vents. The requirement in Chapter 21 to pressurize the tank for leak testing would be difficult to achieve in the field, due to tank construction and
configuration. It is also desirable to prevent water contamination of the cooking oil. A more appropriate test would be to fill the tank with cooking oil to cover all connections and seams below the normal liquid level.

A.19.7.5.1
Waste oil lines are generally pumped until there is little residual oil remaining in the lines. Fresh cooking oil lines are likely to contain residual oil after fill and removal operations. Restricting the fresh oil line size to 1.25 in. (32 mm) maximum inside diameter limits the amount of oil in the line. Additionally, the requirement for check valves or antisiphon valves on the lines at points where the lines connect to the tank eliminates the possibility of a compromised line siphoning the contents of the tank. To the extent possible, transfer lines should avoid being routed over seating areas. These requirements are designed to minimize fire risk by limiting cooking oil quantities in transfer lines that could become involved in a fire. In buildings protected by automatic fire sprinklers, the need to add sprinklers in previously unprotected spaces (assuming the transfer lines are located in these spaces) should be considered in accordance with the requirements of NFPA 13, Standard for the Installation of Sprinkler Systems.

A.19.7.5.2
The temperature and pressure ratings for the waste oil lines are consistent with the maximum expected conditions.
Committee Statement

Committee Statement: Second Revision No. 7 is based on the direction provided to the submitter of Public Comment No. 18 by the NFPA 30 Technical Committee on Operations, at the NFPA 30 First Draft Meeting. During that meeting, Public Input No. 115 was revised to create Committee Input No. 20. Current code requirements present a practical challenge to new restaurant technologies that entirely eliminate manual handling of cooking oil. These systems provide personnel safety and environmental improvements to existing manual or semi-manual oil handling operations. Current fire codes have added requirements for the storage of cooking oil in commercial kitchens and these codes reference or adopt NFPA 30 requirements for specific attributes of Class IIIB storage and handling systems. These fire code requirements emphasize used, spent, and inedible cooking oil. For systems which include fresh cooking oil supply, tanks and components must be food grade. The steel oil burner and industrial aboveground storage tank standards currently referenced in the fire codes do not anticipate food grade processes. NFPA 30 currently does not explicitly recognize nonmetallic systems for food grade processes. There are limitations in listing metallic tanks, using the standards specified, for food grade processes; these include requirements for welds and fillets for metallic tanks that conflict with food grade requirements. The proposal addresses this limitation by adding requirements for non-metallic tanks, with a requirement for listing tanks used with cooking oil. Current design criteria in NFPA 30 are more relevant to industrial flammable and combustible liquid tank requirements.

High flash point cooking oil in a restaurant back-of-house setting represents a different, and generally lower, hazard than commonly anticipated by NFPA 30. The proposed new Section 19.7 that is presented in Second Revision No. 7 unifies all pertinent fire safety requirements into a single location, providing ease of use for users and fire officials. This establishes the level of safety applicable to this hazard. Modifications to current requirements for venting and electrical design have been made to accurately reflect the level of protection for this hazard, as established in NFPA 30. Recognizing the low fire hazard associated with high flash point Class IIIB liquids, NFPA 30 permits vents from tanks storing Class IIIB liquids to discharge within a building and permits non-classified electrical equipment for Class IIIB storage installations inside buildings. Associated requirements for liquid transfer lines have been included. The NFPA 30 Technical Committee on Operations understands that a companion code change has been proposed NFPA 1, Fire Code™, and that this has passed the First Draft stage. Approval of Second Revision No. 7, and its companion Second Revisions (Nos. 9 and 11), will allow the new NFPA 1 language to correlate with NFPA 30, since NFPA 1 adopts NFPA 30 in its entirety.

Response Message:
Public Comment No. 18-NFPA 30-2013 [New Section after 19.6.5]