State of Connecticut
Department of Administrative Services
Division of Construction Services
Office of Education and Data Management

Inspecting for Gasoline And Fuel Oil Tank Installations

Presented by
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for the

Office of Education and Data Management
Spring 2016 Career Development Series

1

BEFORE WE GET STARTED

- HOUSEKEEPING RULES
  - PLEASE TURN OFF CELL PHONES
  - EXIT LOCATIONS
  - REST ROOM LOCATIONS
  - PLANNED SCHEDULE

2

Objective

- Identify legal issue (codes & CGS) requirements
- Cover Plan Review.
- Review code requirements for various installations.
- Discuss manufacturer's installation requirements.
- View installations in progress.

3

Objectives, continued

- For the purpose of this class we will only be discussing tanks and dispensers outside of a buildings, either below or above ground, along with some building issues involved in the construction of canopies.

4

PART ONE

CODES AND REGULATIONS

5

LEGAL REQUIREMENTS AND REGULATIONS

- **UNDERGROUND STORAGE TANK REGULATIONS**
  - REGULATIONS OF CONNECTICUT STATE AGENCIES *(RCSA)* 22a-449(d)-1, 22a-449(d)-101, 22a-449(d)-102 and 22a-449(d)-108 plus Regulatory Summary
  - NFPA 30 *Flammable and Combustible Liquids Code* 2012
  - NFPA 30A *Motor Fuel Dispensing Facilities and Repair Garages* 2012
  - NFPA 31 *Standard for the Installation of Oil-Burning Equipment* 2011
  - International Building Code 2012

6

WHY REVIEW DEEP REGULATIONS?

- DEEP has regulations directly related to tanks that are not covered in the codes.
- Show where DEEP regulations can be found.
- Prevent possible liability issues.

7

Where to view DEEP UST regulations

- DEEP web site UST Registration, Compliance & Release Prevention
- http://www.ct.gov/deep/cwp/view.asp?a=2692&q=322598

8

- **UST Laws and Regulations**
- Regulatory Summary
- UST Regulations (PDF), as revised July 1994
- Amendments to the UST Regulations, May 31, 2012 (PDF)
  - 22a-449(d)1, 22a-449(d)-101, 22a-449(d)-102, 22a-449(d)-108
- Excerpts from Section 22a-449 of the Connecticut General Statutes that contain requirements for USTs (that are not in regulations)
- Notice of Intent to Amend the UST Regulations and to Hold a Public Hearing
- For further information please contact the Storage Tank Enforcement Unit at (860) 424-3374 or e-mail the Program Coordinator or write to:
- Department of Energy and Environmental Protection
  Bureau of Materials Management and Compliance Assurance
  Storage Tank Enforcement and PCB Unit
  79 Elm Street
  Hartford, CT 06106-5127

9

CONNECTICUT DEPT. OF ENERGY AND ENVIRONMENTAL PROTECTION

- UNDERGROUND STORAGE TANK REGULATIONS
  - www.ct.gov/dep/lib/dep/regulations/22a
- (Use as search) regulations of Connecticut state agencies underground storage tank regulations

- Amendments to Regulations of Connecticut State Agencies Regarding Underground Storage Tanks, Sections 22a-449(d)-1, 22a-449(d)-101, 22a-449(d)-102, and 22a-449(d)-108 also:
- CGS.Sec.22a-449(Formerly Sec. 25-54cc). Duties and Powers of commissioner. Fees,
  - UST Notification Fees
  - Red Tag (22a-449(g)(1))
  - UST installation fee
  - Off-Site Storage of Records
  - Installation of ***new*** equipment after Aug. 8, 2012 (Cgs.22a-449 (d)-102(a))

10

- Underground storage tank regulatory summary can be found at:
- http://www.ct.gov/deep/cwp/

- Underground storage tank regulations can be found at:
- http://www.ct.gov/deep/lib/deep/regulations/22a/22a-449(d)-revisions.pdf

11

PURPOSE OF REGULATIONS

- **Sections 22A-449(d)-1, 22A-449(d)-101, 22a-449(d)-102 and 22a-449(d)-108, REGULATIONS OF CT. STATE AGENCIES *IS TO***

- **ESTABLISH A COMPREHENSIVE REGULATORY PROGRAM FOR UNDERGROUND STORAGE TANKS CONTAINING REGULATED SUBSTANCES SUBJECT TO THE (REGULATIONS OF CONNECTICUT STATE AGENCIES) RCSA**

12

ENFORCEMENT

- ENFORCED BY CT DEPT. OF ENERGY AND ENVIRONMENTAL PROTECTION (D.E.E.P.)
  - BUREAU OF METERIAL MANAGEMENT
  - COMPLIANCE ASSURANCE EMERGENCY RESPONSE AND SPILL PREVENTION

13

DEEP Continued

- Double wall requirement
  - CGS. Sec. 22a-449o. Requirement for double-walled underground storage tanks
- Off-site Storage of Records at a Centralized Location
  - CGSA Sec. 22a-449q. Storage of underground storage tank system records.

14

Regulations (RCSA) Sec. 22a-449(d)-1

- REGULATIONS DO NOT GENERALLY SPECIFY HOW INSTALLATION IS TO BE ACCOMPLISHED AND REFERS TO ***NFPA 30*** FOR THE INSTALLATION AND MAINTENANCE OF UNDERGROUND COMPONENTS
- ***HOWEVER***
  - ***Regulations cover;***
    - ***Tank types***
    - ***Corrosion protection requirement***
    - ***Failure determination, and***
    - ***Chemical compatibility***

15

Regulations (RCSA)

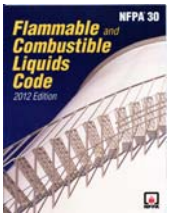
- Exemptions: *(DEEP Criteria)* *(May pertain to systems installed in your municipality)*
- 1. Facilities must meet ***all*** of the following criteria to be exempt from subsections 22a-449(d)-1 (d),(g),(h) & (i):
- Less than 2100 Gal.
- Use is for on-site heating or intermittent stationary power production or irrigation pump power.
- Not intended for resale.
- Facility not used for storage or handling of waste oil

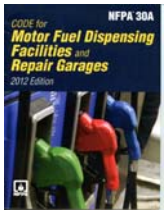
16

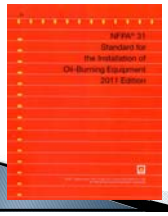
Exemptions cont.

- 2. Oil that will not flow below 60 degrees.
- 3. Facilities used solely for on site heating, process steam generation, other on-site combustion or manufacturing processes or waste oil storage are exempt from subdivision 22a-449 (d)-1(g)(2).
- *(d)-1 = Reporting*
- *(g)(2) = Daily inventory records*
- *(h) = Life expectancy*
- *(i) = Failure determination*

17





18

Double walled tanks

- Requirement for double walled tanks found in CGS. (Connecticut General Statutes)
- Regulations of Connecticut State Agencies Regulations For Underground Storage Tanks
- Sec. 22a-449(d)-1 (e)

19

Cathodic Protection Systems Sec. 22a-449(d)-1 (e) cont.

- Fiberglass or Steel tanks
- Other components protected from corrosion.
- **Installation to be done according to NFPA30**
- *(When NFPA30 and manufacturer's specifications are inconsistent)* Provisions which imposes the most stringent and protective requirement shall control.

20

- The following 7 slides provide a pathway for the installation of oil tanks according to NFPA 30 as part of an installation of gasoline tanks or stand alone fuel oil tanks

21

2005 CONNECTICUT SUPPLEMENT

THIS SECTION MODIFIED BY CGS CHANGE EFFECTIVE JAN. 1, 2013

- ADD 101.4.8 TO 2003 INT.BUILDING CODE
  - ***Oil burning equipment, piping and storage***. In addition to the requirements of this code, the installation of oil burners and equipment used in connection therewith, including tanks, piping, pumps, control devices and accessories **shall comply with section 29-316** and 29-317 of the Connecticut General Statutes, and the regulations known as the Connecticut Oil Burning Equipment Code adopted by the commissioner of Public Safety under authority of section 29-317 of the CGS.

22

2005 Supplement

- ***Add 101.4.8 .1 Local Regulations***
  - Pursuant to section 29-316 of the Connecticut General Statutes, the warden, or burgesses of a borough, the selectman of a town, the common council of a city or the commissioners of a fire district may enact rules and regulations for the installation of fuel oil burners, equipment therefore and fuel oil storage tanks
  - Not removed from Supplement as of writing of this program
  - **Chapter 29 section 29-316 REPEALED Jan. 1 2013 from CT. General Statutes**

23

Change in CGS

- Elimination of Section 29-316
- Sec. 29-316, Regulation of fuel oil burners. Section 29-316 is repealed, effective January 1, 2013.

24

- Sec. 29-320. (Formerly Sec. 29-62). Regulations concerning flammable or combustible liquids. The Commissioner of Administrative Services shall adopt and may amend, reasonable regulations in accordance with the provisions of chapter 54, concerning the safe storage, use, transportation by any mode and transmission by pipeline of flammable or combustible liquids. Such regulations shall be incorporated into the State Fire Prevention Code and shall include provisions for the prevention of damage to property and injury to life, and protection from hazards incident to the storage, use, transportation by any mode and transmission by pipeline of such liquids. The commissioner shall enforce such regulations. Such regulations shall not apply to any electric distribution company or gas company, as such terms are defined in section 16-1.

25

- **Sec. 29-317. (Formerly Sec. 29-60). *(See end of section for amended version and effective date.) Regulation of installation of oil burners. Variations or exemptions.** (a) The Commissioner of Public Safety shall make regulations prescribing reasonable minimum requirements for the installation of oil burners and equipment used in connection therewith, including tanks, piping, pumps, control devices and accessories. In adopting such regulations, the commissioner may adopt by reference standards concerning the installation of oil burners and equipment as set forth by the National Fire Protection Association for the prevention of injury to life and damage to property, and protection from hazards incident to the installation and operation of such oil burners and equipment.

  (b) No regulation made in accordance with this section shall be inconsistent with the provisions of section 29-316, nor apply to premises used for manufacturing nor to public service companies as defined in section 16-1, nor impair the rights of municipalities to enact ordinances and make rules and regulations for the installation of oil burners and equipment so far as such ordinances, rules and regulations specify requirements equal to, additional to or more stringent than the regulations issued under the authority of this section.

  (c) The Commissioner of Public Safety may grant variations or exemptions from, or approve equivalent or alternate compliance with, particular provisions of any regulation issued under the provisions of this section where strict compliance with such provisions would entail practical difficulty or unnecessary hardship or is otherwise adjudged unwarranted, provided any such variation, exemption, approved equivalent or alternate compliance shall, in the opinion of the commissioner, secure the public safety and shall be made in writing.

  (d) Any person aggrieved by any such regulation or by any act of said commissioner in enforcing the same may apply for relief to the superior court for the judicial district of Hartford or for the judicial district in which such oil burner or equipment is located or, if said court is not in session, to any judge thereof, who may grant appropriate relief.

  (e) Any person who, by himself or his employee or agent, or as the employee or agent of another, violates or fails to comply with any regulation promulgated under this section shall be fined not more than one hundred dollars or imprisoned not more than six months or both.

***Note: On and after January 1, 2013, this section, as amended by section 7 of public act 09-177 and sections 1 and 6 of public act 10-54, is to read as follows:**

26

- ***Note:** On and after January 1, 2013, this section, as amended by section 7 of public act 09-177 and sections 1 and 6 of public act 10-54, is to read as follows:

  "Sec. 29-317. (Formerly Sec. 29-60). Regulation of installation of oil burners. Incorporation into State Fire Prevention Code. Exemption. (a) The Commissioner of Public Safety shall adopt regulations, in accordance with the provisions of chapter 54, prescribing reasonable minimum requirements for the installation of oil burners and equipment used in connection therewith, including tanks, piping, pumps, control devices and accessories. Such regulations shall be incorporated into the State Fire Prevention Code and shall include provisions for the prevention of injury to life and damage to property, and protection from hazards incident to the installation and operation of such oil burners and equipment.

  (b) No regulation made in accordance with this section shall apply to any electric company, gas company or electric distribution company as such terms are defined in section 16-1."

27

Connecticut State Fire Prevention Code recognizes NFPA 31(2011)

- NFPA *31Standard for the Installation of Oil-Burning Equipment* (2011) (including tanks)
- Section 7.4.5 Underground tanks shall be installed in accordance with the manufacturer's instructions and in accordance with the applicable requirements of Chapter 23 of NFPA 30, *Flammable and Combustible Liquids Code*

28

NFPA 31

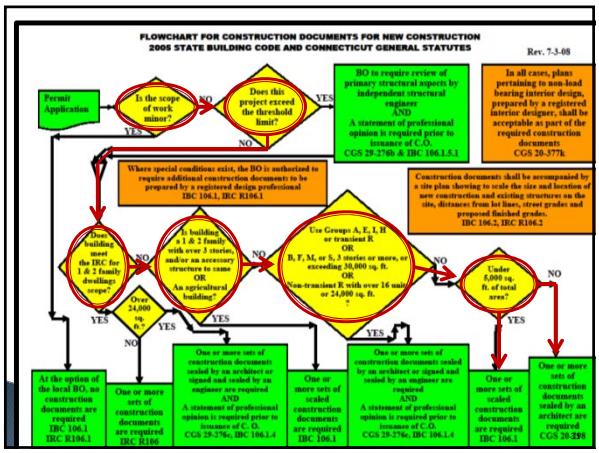
- Section 7.8.3 A tank or tanks whose capacity exceeds 660 gal. (2500L) shall be installed in accordance with all applicable requirements of Chapter 22 of NFPA 30, *Flammable and combustible Liquids Code*

29

PART 2

PLAN REVIEW

30



IBC Chapter 1

- Administration section allows Building Official to request additional documentation

32

34

Verify compliance with 22aq-449(d)-102

- **Fiberglass tanks comply with UL Standard 1316 or CAN4-S615-M83,** *Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tank for Petroleum Products. (Reference also in NFPA30)* OR
- **ASTM D4021-86** *"Standard Specification for Glass-Fiber-Reinforced Polyester Underground Petroleum Storage Tanks". (Reference not found in NFPA 30)*

35

36

Verify compliance with 22aq-449(d)-102 Continued

- **Steel tanks**:
- **Steel Tank Institute** *"Specification for STI-P3 System of External Corrosion Protection of Underground Steel Storage Tanks"* *(Only found in Annex I in NFPA 30)*
- **UL Standard 1746,** *"Corrosion Protection Systems for U/G Storage Tanks".* *(Also found in Sec. 21.4.2 NFPA 30)*
- **UL Canada CAN4-S603-M85** *"Standard For Steel U/G Tanks for Flammable and Combustible Liquids" and*
- **CAN4-G03.1-M85** *"Standard for Galvanic Corrosion Protection Systems for U/G Tanks for Flammable and Combustible Liquids" and*
- **CAN4-S631-M84** *"Isolating Bushings for Steel Underground Tanks Protected with Coatings and Galvanic Systems". or*

37

38

Verify compliance with 22aq-449(d)-102 Continued

- **National Association of Corrosion Engineers Standard RP-02-85** *"Control of External Corrosion on Metallic Buried, or Submerged Liquid Storage Systems"* *(Also found in Annex I NFPA 30)* and
- **UL Standard 58,** *"Standard for Steel Underground Tanks for Flammable and Combustible Liquids".* *(Also found in Sec. 21.4.2 NFPA 30)*

39

Verify compliance with 22aq-449(d)-102 Continued

- **Piping, Fiberglass:**
- **UL Subject 971,** "UL Listed Non-Metal Pipe". (Also found in NFPA 30 Sec. 27.4.6.2)
- **UL Standard 567,** *"Pipe Connectors for Flammable and Combustible and LP Gas". (Not found in NFPA 30)*
- **UL Canada Guide CLC-107** "Glass-Fiber-Reinforced Plastic Pipe and Fittings for Flammable Liquids".
- **UL Canada Standard CAN 4-S633-M81**, *"Flexible Underground Hose Connectors".* and

40

NFPA 30A

Motor Fuel Dispensing Facilities and Repair Garages

- **Chapter 5, Piping for Liquids**
- Section 5.2.1 Piping systems shall meet the requirements of Chapter 27 of NFPA 30

41

Verify compliance with 22aq-449(d)-102 Continued

- Steel Pipe:
- **NFPA Standard 30,** *"Flammable and Combustible Liquids Code"*
- **American Petroleum Institute Publication 1615,** *"Installation of Underground Petroleum Storage Systems". (Annex I NFPA30)*
- **American Petroleum Institute Publication 1632,** *"Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems". (Annex I NFPA30)*
- And
- **National Association of Corrosion Engineers Standard RP-01-69,** *"Control of External Corrosion on Submerged Metallic Piping Systems". (Annex I NFPA 30)*

42

LCX PIPE

- RIGID FIBERGLASS COAXIAL PIPE.
- USED FOR CONTAINED PIPING SYSTEMS
- PRODUCT DELIVERY LINES IN UNDERGROUND FUEL HANDLING SYSTEMS TO CONVEY FUEL FROM TANK TO DISPENSERS.

43

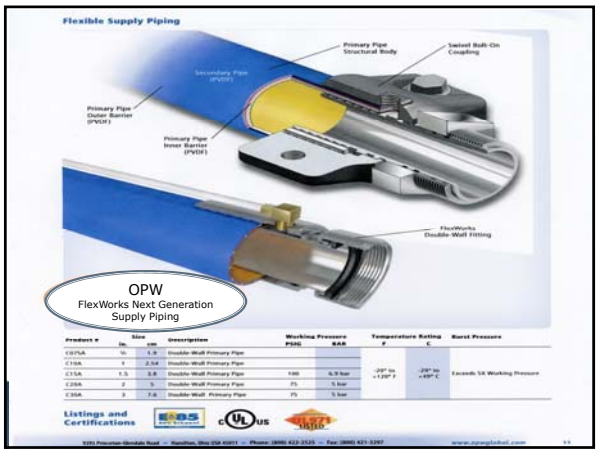
LCX PIPE

47

GUIDE TO NONMETALLIC PIPE IDENTIFICATION

http://www.nwglde.org/downloads/flexpipeid_guide.pdf

48



NFPA 30, Sec. 21.4 DESIGN AND CONSTRUCTION

- Steel or other approved material (Fiberglass)
- Use of unlined concrete tanks permitted with special requirements
- Combustible or non combustible linings permitted with special requirements
- Engineering evaluation required if liquid has specific gravity greater than water or below 0 degrees F.
  - ***Bottom Line: It all depends on the liquid being stored***

50

Verify compliance with 22aq-449(d)-102 Continued

- Municipalities with fuel oil tanks and/or gasoline tanks are responsible for proper installation. However Exemptions from some, none or all reporting, records, life expectancy and failure determination may not apply
- Regulations of CT State Agencies Section 449(d)-1(c)

51

NFPA 30, Sec. 21.4 DESIGN AND CONSTRUCTION

- **ADDED;**
- ***UL1316;*** *Standard for Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols and Alcohol-Gasoline Mixtures*
- **UNCHANGED**
- ***UL 58;*** Steel U/G
- ***ANSI/UL 80;*** Steel tanks, Oil burner fuels
- ***ANSI/UL 142;*** Steel above ground

52

NFPA 30, Sec. 21.4 DESIGN AND CONSTRUCTION

- ***ANSI/UL 1746***; Steel tanks, External corrosion protection
- ***UL2080;*** fire resistant tanks
- ***ANSI/UL 2085;*** protected above ground tanks
- ***API 12B;*** Bolted tanks
- ***API 12D;*** Field welded tanks
- ***API 12F;*** Shop welded tanks
- ***API 650***; welded steel tanks for oil storage

53

2012 INTERNATIONAL MECHANICAL CODE

- ***GENERAL***
  - REFERS BACK TO NFPA 31, THE INT. FIRE CODE chapters 6 and 57
  - *2012 IMC refers to International Fire Code*
- ***MATERIALS***
  - HAS STANDARDS FOR PIPE BUT NO MENTION OF TANKS

54

MECHANICAL CODE 2012

- **2012 IMC HAS SECTIONS ON** (fuel oil only)
  - PIPE SUPPORT
  - FUEL OIL SYSTEM INSTALLATION
  - OIL GAUGING
  - FUEL OIL VALVES
  - TESTING (PER NFPA 31)
  - LESS THAN 3 PAGES

55

2012 INTERNATIONAL PLUMBING CODE

- No mention of any oil or gasoline tanks and piping, specifically.
- Definition of Plumbing does not include this type of piping installation.

56

NFPA 30
FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE

- **2015 FIRE PREVENTION CODE REFRENCES**
  2012 EDITION OF NFPA 30
- **PURPOSE**
  - PROVIDE FUNDAMENTAL SAFEGUARDS FOR THE STORAGE, HANDLING, AND USE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS

57

LINK TO 2015 STATE OF CONNECTICUT FIRE PREVENTION CODE

- http://www.ct.gov/dcs/lib/dcs/office_of_state_fire_marshal_files/fire_prevention_code_2012_eff_5-7-2015.pdf or
- *Google*: 2015 connecticut fire prevention code

58

CONNECTICUT CHANGES TO NFPA 30 CONTINUED

- **SEC. 29-291a-1a** (OSFM) (CHANGE), "THE AUTHORITY HAVING JURISDICTION" SHALL MEAN THE STATE FIRE MARSHAL REGARDING THE PROPER ADMINISTRATION, APPLICATION, INTERPRETATION AND MODIFICATION OF THE REQUIREMENTS CONTAINED WITHIN SECTIONS 29-291a-1a TO 29-291a-10a, INCLUSIVE, OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES.

59

AUTHORITY HAVING JURISDICTION CSFPC Sec. 29-291a-4a

- **The local fire marshal shall make the initial determination concerning compliance with this code except as stated otherwise in the wording of this section**

60

AUTHORITY HAVING JURISDICTION CSFP Code

- (Amd)1.7.4 *Enforcement Assistance*. The State Fire Marshal or local fire marshal may accept reports of the building official concerning a code compliance review or inspection in lieu of conducting the review or inspection personally.

61

2015 CT. FIRE PREVENTION CODE

- Fire prevention code not applicable to one and two family and town houses
- 2012 IRC, Sec.M2201.2 residential in excess of 660 gallons shall comply with NFPA 31

62

Plan review and the Building and Fire Codes

- Building Code considerations required when installations include a new canopy, along with new tanks and dispensers.
- Site plan.
- Zoning approval.
- Soil types and compaction requirements.
- Soil compaction reports.
- Required distance to buildings and property lines.(NFPA 30A-6.2.1)
- Footing engineering design.
- Canopy engineering design.

63

Plan review and the Building and Fire Codes (continued)

- Tank and piping drawings.
- Tank and piping materials.
- Tanks above or below ground.
- *Manufacturer's installation instructions.*
- Electrical system, Emergency Electrical Disconnects, (NFPA 30A-6.7)

64

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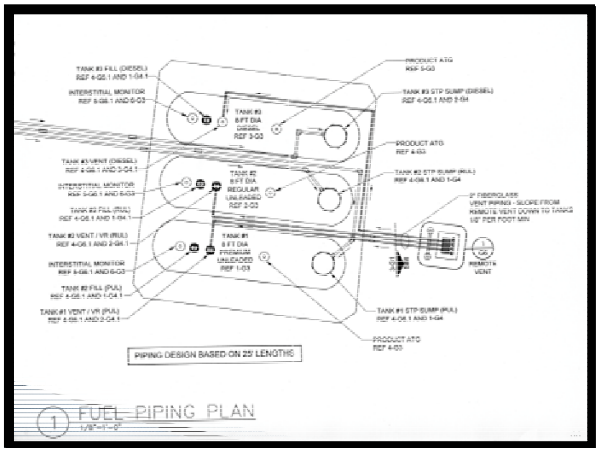

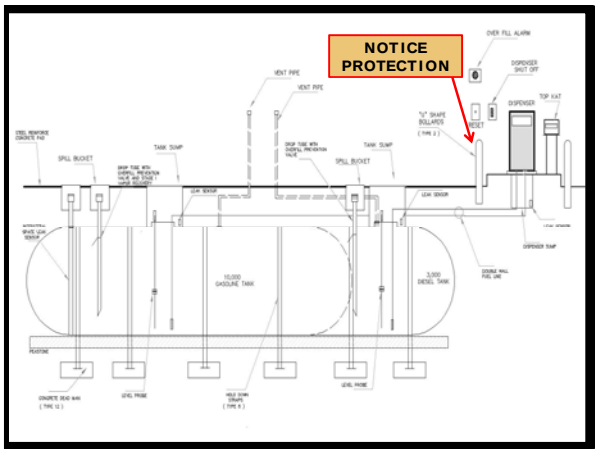

OOPS!

NOTICE NO PRTOTECTION

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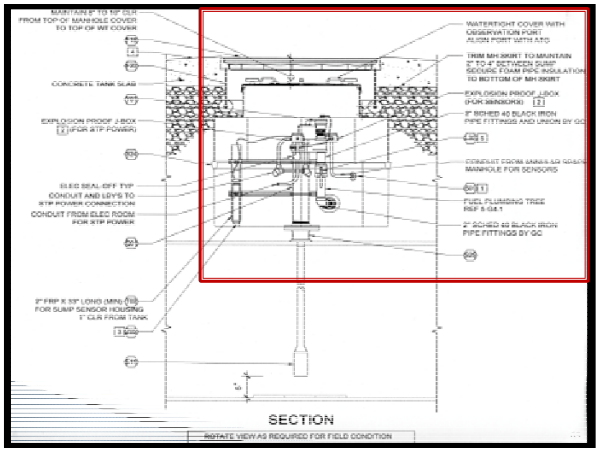
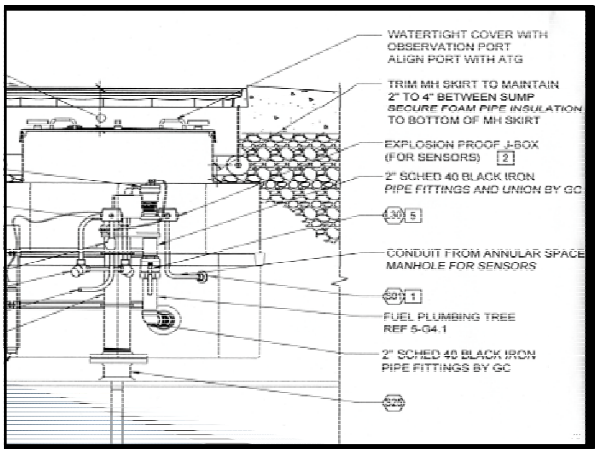
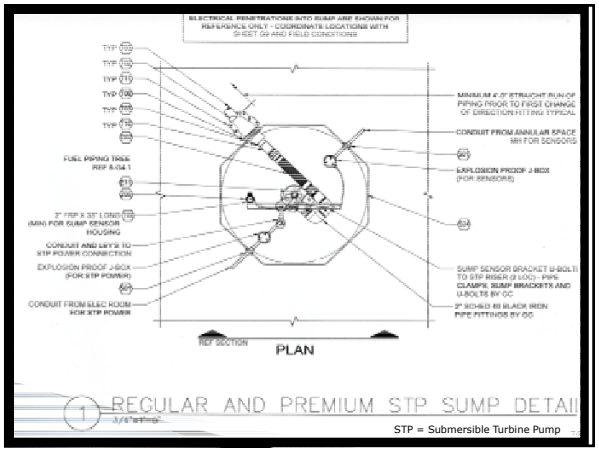
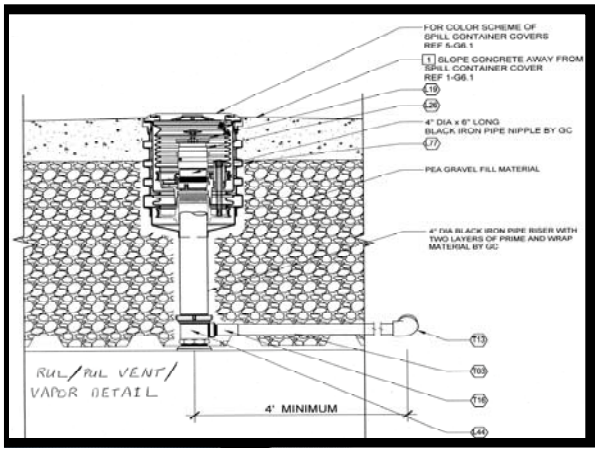


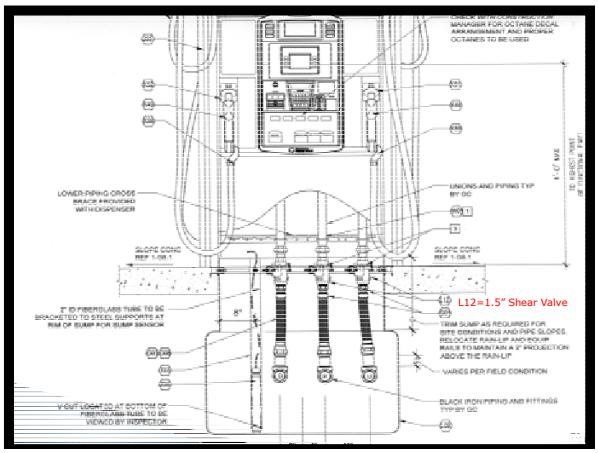

WATERTIGHT COVER WITH OBSERVATION PORT ALIGN PORT WITH ATG
TRIM MH SKIRT TO MAINTAIN 2" TO 4" BETWEEN SUMP
SECURE FOAM PIPE INSULATION TO BOTTOM OF MH SKIRT
EXPLOSION PROOF J-BOX (FOR SENSORS) 2
2" SCHED 40 BLACK IRON PIPE FITTINGS AND UNION BY GC
CONDUIT FROM ANNULAR SPACE MANHOLE FOR SENSORS
FUEL PLUMBING TREE REF 5-G4.1
2" SCHED 40 BLACK IRON PIPE FITTINGS BY GC

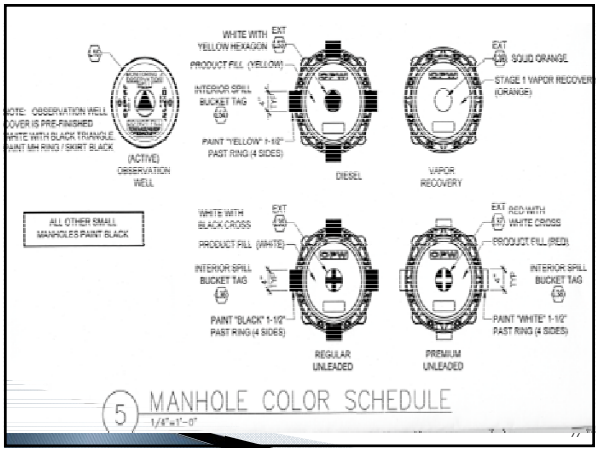

FRANKLIN ELECTRIC TURBINE PUMP
RED JACKET TURBINE SUBMERSIBLE PUMP

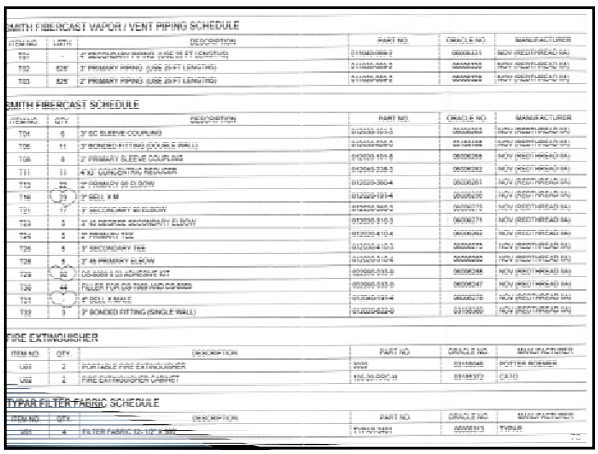


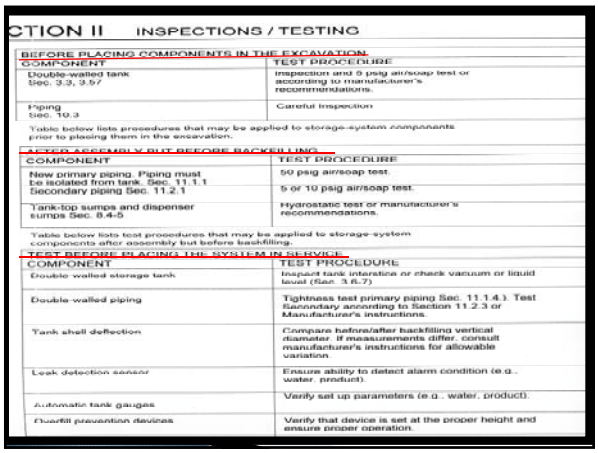
STP = Submersible Turbine Pump




L12=1.5" Shear Valve


WHITE WITH YELLOW HEXAGON
PRODUCT FILL (YELLOW)
INTERIOR SPILL BUCKET TAG
PAINT "YELLOW" 1-1/2" PAST RING (4 SIDES)
DIESEL
SOLID ORANGE
STAGE 1 VAPOR RECOVERY (ORANGE)
VAPOR RECOVERY
(ACTIVE) OBSERVATION WELL
ALL OTHER SMALL MANHOLES PAINT BLACK
WHITE WITH BLACK CROSS
PRODUCT FILL (WHITE)
PAINT "BLACK" 1-1/2" PAST RING (4 SIDES)
REGULAR UNLEADED
RED WITH WHITE CROSS
PRODUCT FILL (RED)
PAINT "WHITE" 1-1/2" PAST RING (4 SIDES)
PREMIUM UNLEADED
5 MANHOLE COLOR SCHEDULE
1/4"=1'-0"


SMITH FIBERCAST VAPOR / VENT PIPING SCHEDULE
SMITH FIBERCAST SCHEDULE
FIRE EXTINGUISHER
TYPAR FILTER FABRIC SCHEDULE



CTION II INSPECTIONS / TESTING

BEFORE PLACING COMPONENTS IN THE EXCAVATION.

COMPONENT	TEST PROCEDURE
Double-walled tank Sec. 3.3, 3.5.7	Inspection and 5 psig air/soap test or according to manufacturer's recommendations.
Piping Sec. 10.3	Careful inspection

Table below lists procedures that may be applied to storage system components prior to placing them in the excavation.

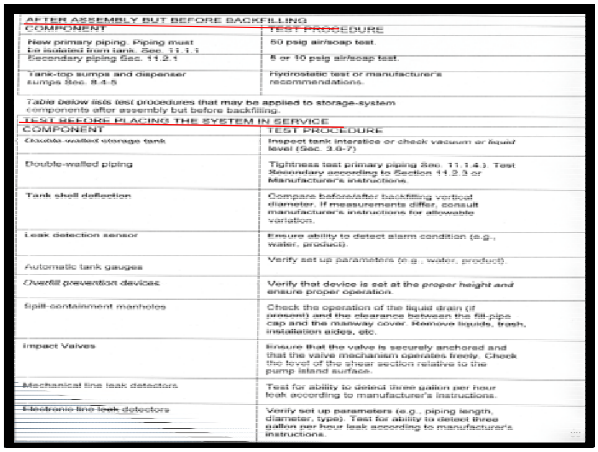
AFTER ASSEMBLY BUT BEFORE BACKFILLING

COMPONENT	TEST PROCEDURE
New primary piping. Piping must be isolated from tank. Sec. 11.1.1 Secondary piping Sec. 11.2.1	50 psig air/soap test. 5 or 10 psig air/soap test.
Tank-top sumps and dispenser sumps Sec. 8.4-5	Hydrostatic test or manufacturer's recommendations.

Table below lists test procedures that may be applied to storage system components after assembly but before backfilling.

TEST BEFORE PLACING THE SYSTEM IN SERVICE

COMPONENT	TEST PROCEDURE
Double-walled storage tank	Inspect tank interstice or check vacuum or liquid level (Sec. 3.6.7)
Double-walled piping	Tightness test primary piping Sec. 11.1.4.). Test Secondary according to Section 11.2.3 or Manufacturer's instructions.
Tank shell deflection	Compare before/after backfilling vertical diameter. If measurements differ, consult manufacturer's instructions for allowable variation.
Leak detection sensor	Ensure ability to detect alarm condition (e.g., water, product).
Automatic tank gauges	Verify set up parameters (e.g., water, product).
Overfill prevention devices	Verify that device is set at the proper height and ensure proper operation.



AFTER ASSEMBLY BUT BEFORE BACKFILLING

COMPONENT	TEST PROCEDURE
New primary piping. Piping must be isolated from tank. Sec. 11.1.1 Secondary piping Sec. 11.2.1	50 psig air/soap test. 5 or 10 psig air/soap test.
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Table below lists test procedures that may be applied to storage system components after assembly but before backfilling.

TEST BEFORE PLACING THE SYSTEM IN SERVICE

COMPONENT	TEST PROCEDURE
Double-walled storage tank	Inspect tank interstice or check vacuum or liquid level (Sec. 3.6-7)
Double-walled piping	Tightness test primary piping Sec. 11.1.4.). Test Secondary according to Section 11.2.3 or Manufacturer's instructions.
Tank shell deflection	Compare before/after backfilling vertical diameter. If measurements differ, consult manufacturer's instructions for allowable variation.
Leak detection sensor	Ensure ability to detect alarm condition (e.g., water, product).
Automatic tank gauges	Verify set up parameters (e.g., water, product).
Overfill prevention devices	Verify that device is set at the proper height and ensure proper operation.
Spill containment manholes	Check the operation of the liquid drain (if present) and the clearance between the fill-pipe cap and the manway cover. Remove liquids, trash, installation aides, etc.
Impact Valves	Ensure that the valve is securely anchored and that the valve mechanism operates freely. Check the level of the shear section relative to the pump stand surface.
Mechanical line leak detectors	Test for ability to detect three gallon per hour leak according to manufacturer's instructions.
Electronic line leak detectors	Verify set up parameters (e.g., piping length, diameter, type). Test for ability to detect three gallon per hour leak according to manufacturer's instructions.

Aquifer Protection Areas

- Something else to consider

81

AQUIFER PROTECTION

- CONNECTICUT AQUIFER PROTECTION AREA PROGRAM
- 127 ACTIVE WELL FIELDS
- 81 TOWNS
- LAND USE REGULATIONS ESTABLISHED TO MINIMIZE POTENTIAL FOR CONTAMINATION OF WELL FIELDS

82

AQUIFER PROTECTION

- THE AQUIFER PROTECTION AREA PROGRAM RESPONSIBILITIES ARE SHARED BY THE STATE DEEP, THE MUNICIPALITIES AND WATER COMPANIES

83

AQUIFER PROTECTION

- ***STATE OF CONNECTICUT DEEP RESPONSIBLE FOR OVERALL PROGRAM***
- **ASSISTS MUNICIPALITIES**
- **DIRECTLY REGULATE MAJOR FACILITIES**
- **EDUCATES PUBLIC**

84

AQUIFER PROTECTION

REGULATED LAND USE

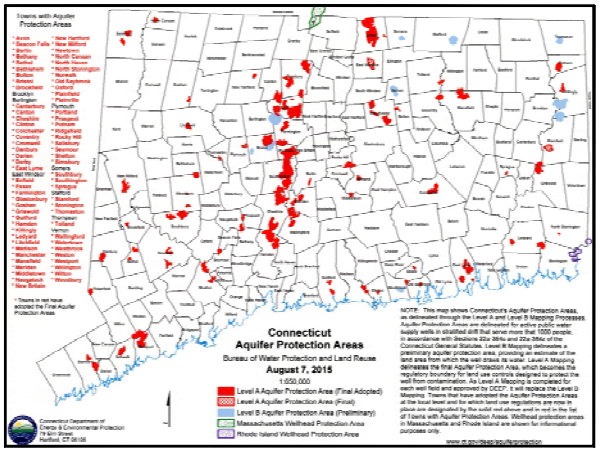
#1 REGULATED ACTIVITY

85

AQUIFER PROTECTION

UNDERGROUND STORAGE OR TRANSMISSION OF OIL, PETROLEUM OR HAZARDOUS MATERIAL

86



Plan review and the Building and Fire Codes (continued)

- **Electrical Installations NFPA 30A**, (Sec. 8.2) General Requirements. Electrical wiring and electrical utilization equipment shall be of a type specified by and shall be installed in accordance with *NFPA 70, National Electrical Code.* Electrical wiring and electrical utilization equipment shall be approved for the locations in which they are installed.

89

Plan review and the Building and Fire Codes (continued)

- **Electrical Systems NFPA 30**, (Sec.7.3.2) All Electrical utilization equipment and wiring shall be of a type specified by and installed in accordance *with NFPA 70, National Electrical Code.*
- **Electrical Systems NFPA 30A,** Chapter 8, In accordance *with NFPA 70*

90

Delineate and classify areas for the purpose of installation of electrical utilization equipment

- NFPA 30, Table 7.3.3
- NFPA 30A, Table 8.3.1

91

NFPA 30, Table 7.3.3

Table 7.3.3 Electrical Area Classifications

Location	*NEC* Class I Division	*NEC* Class I Zone	Extent of Classified Area
Indoor equipment installed in accordance with Section 7.3 where flammable vapor–air mixtures can exist under normal operation	1	0	The entire area associated with such equipment where flammable gases or vapors are present continuously or for long periods of time
	1	1	Area within 5 ft of any edge of such equipment, extending in all directions
	2	2	Area between 5 ft and 8 ft of any edge of such equipment, extending in all directions; also, space up to 3 ft above floor or grade level within 5 ft to 25 ft horizontally from any edge of such equipment[1]
Outdoor equipment of the type covered in Section 7.3 where flammable vapor–air mixtures can exist under normal operation	1	0	The entire area associated with such equipment where flammable gases or vapors are present continuously or for long periods of time
	1	1	Area within 3 ft of any edge of such equipment, extending in all directions
	2	2	Area between 3 ft and 8 ft of any edge of such equipment, extending in all directions; also, space up to 3 ft above floor or grade level within 3 ft to 10 ft horizontally from any edge of such equipment

NFPA 30A Table 8.3.1

Table 8.3.1 Electrical Equipment Classified Areas — Motor Fuel Dispensing Facilities

Location	*NEC* Class I, Group D Division	Extent of Classified Area[a]
Dispensing device[b,c]	(Except overhead type)	*(see Figure 8.3.1)*
Pits	1	Any pit or box below grade level, any part of which is within a Division 1 or 2 classified area
Dispenser	2	Within 46 cm (18 in.) horizontally in all directions extending to grade from the dispenser enclosure or that portion of the dispenser enclosure containing liquid handling components[c]
Outdoor	2	Up to 46 cm (18 in.) above grade level within 6 m (20 ft) horizontally of any edge of enclosure
Indoor		
With mechanical ventilation	2	Up to 46 cm (18 in.) above grade or floor level within 6 m (20 ft) horizontally of any edge of enclosure
With gravity ventilation	2	Up to 46 cm (18 in.) above grade or floor level within 7.6 m (25 ft) horizontally of any edge of enclosure
Dispensing device — overhead[c,d]		The area within the dispenser enclosure and all electrical equipment integral with the dispensing hose or nozzle
	2	An area extending 46 cm (18 in.) horizontally in all directions beyond the enclosure and extending to grade
	2	Up to 46 cm (18 in.) above grade level within 6 m (20 ft) horizontally measured from a point vertically below the edge of

b Refer to Figure 8.3.1 for an illustration of classified areas around dispensing devices
c Area classification inside the dispenser enclosure is covered in UL 87, Standard for Power- Operated Dispensing Devices for Petroleum Products

Fig. 8.3.1 NFPA 30A, Classified Areas Adjacent to Dispensers

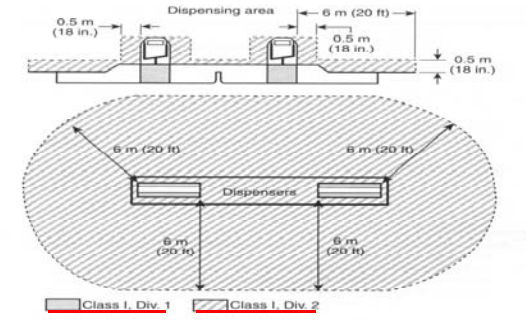
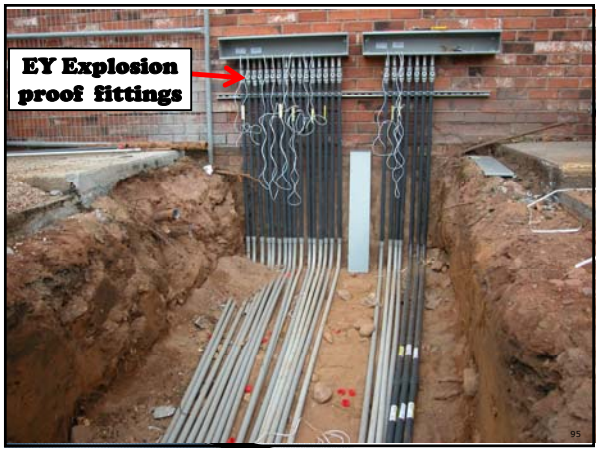


FIGURE 8.3.1 Classified Areas Adjacent to Dispensers as Detailed in Table 8.3.1.

4



95

- Will installation, include provisions for dispensing (LP-Gas), (LNG), or (CNG) as a motor vehicle fuel? *(Requires additional Codes)*
- Chapter 12, NFPA 30A Additional Requirements where CNG, LNG, Hydrogen, and LPG are dispensed.
- CNG, Hydrogen and LNG = NFPA 52, ***Vehicular Fuel Systems Code***
- LPG = NFPA 58, ***Liquefied Petroleum Gas Code***

96

CNG Fueling Facility

97

CNG Fueling Facility

98

CNG Fueling Facility

99

TANK REMOVAL

- Local Municipalities should require permits for tank removal. **(However)**
- DEEP is responsible for leaks and resulting remediation.
- Local Fire Marshal or Building Official should only verify that tank has been removed.
- It is the responsibility of the tank removal contractor to contact DEEP if a leak is detected.

100

TANK REMOVAL

- Home improvement contractors conducting underground storage tank removal must comply with the following guidelines;
- Provide evidence of liability insurance; of 1 million dollars
- Completion of 40 hour Hazardous Materials Incident Response Operations (HAZOPER)
- 8 hours health and safety training
- Pass ICC Decommissioning Exam

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MODIFICATION REQUESTS

- Requests for modification must go through the local fire marshals office to the state fire marshals office.
- Where building issues exist, modifications shall also be required from local Building Dept.
- connecticut department of public safety web site www.ct.gov/dps

106

NFPA 30

- FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE
- A GUIDE FOR THE INSTALLATION OF TANKS AND PIPING

107

- **The format of the 2012 edition of NFPA30 was changed from 8 chapters to 29 chapters. The number of pages was not significantly increased, however the content of the chapters are shorter and more narrowly focused**

108

NFPA 30–2012 CONTINUED

- *CHAPTER 1 ADMINISTRATION*
- **SCOPE**
  - STORAGE, HANDLING, USE
- **PURPOSE**
  - PROVIDE FUNDAMENTAL SAFEGUARDS FOR STORAGE, HANDLING, AND USE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS
- **RETROACTIVITY**
  - GENERALLY NOT RETROACTIVE (BUT CAN BE)
- **EQUIVALENCY**
  - ALLOWS USE OF OTHER MATERIALS AND METHODS

109

110

111

NFPA 30 REQUIREMENTS

- Definitions
- All equipment and materials shall be properly listed and labeled.
- **3.3.7 Bonding**. For the purpose of controlling static electric hazards, the process of connecting two or more conductive objects together by means of a conductor so that they are at the same electrical potential, but not necessarily at the same potential as the earth.

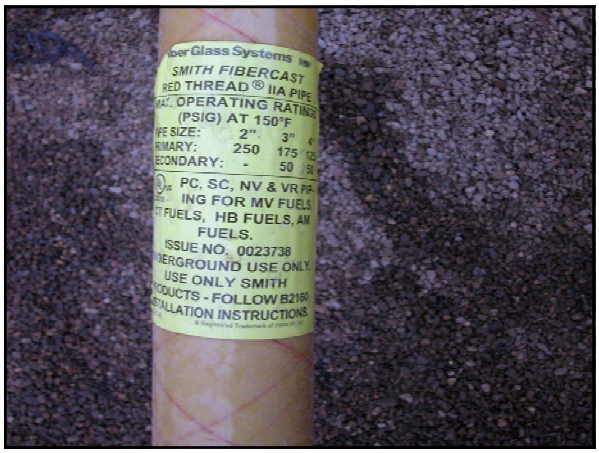
115

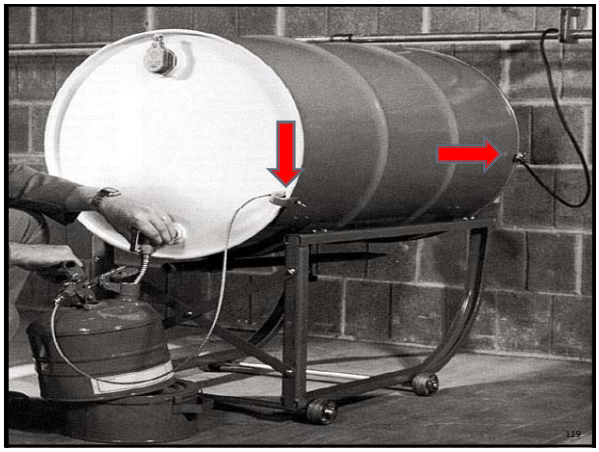
Definitions Continued

- **3.3.23 Grounding**. The process of bonding one or more conductive objects to the ground, so that all objects are at zero electrical potential.
- Corrosion protection:
  - No formal definition
  - Must meet the requirements of Sec.21.4.5 and Sec. 23.3.5 for "*Corrosion Protection*"
  - Engineered system
  - Manufacturer's instructions

116

117





DEFINITIONS CHAPTER 3 & 4

- *FLASH POINT (no change)*
- MINIMUM TEMP.OF A LIQUID AT WHICH SUFFICIENT VAPOR IS GIVEN OFF TO FORM AN IGNITIBLE MIXTURE WITH AIR, NEAR THE SURFACE OF THE LIQUID

120

New added definitions

- ***Alcohol based Hand Rub (ABHR) .*** Containing ethanol or isopropanol not more than 95% of volume.
- ***Control area.*** Building or portion where combustibles are allowed to be stored, dispensed, used or handled in quantities greater than maximum allowable quantity(MAQ)

121

NFPA 30, 2012
CLASSIFICATION OF LIQUIDS

FLAMMABLE LIQUID

CLOSED-CUP FLASH POINT BELOW 100 DEGREES F

COMBUSTIBLE LIQUID

CLOSED-CUP FLASH POINT AT OR ABOVE 100 DEGREES

122

CLASSIFICATION CONTINUED (same 96-03)

- CLASS IA LIQUID

FLASH POINT BELOW 73°F & BOILING POINT BELOW 100°F

- CLASS IB LIQUID

FLASH POINT BELOW 73°F, AND BOILING POINT AT OR ABOVE 100°F
(gasoline)

- CLASS IC LIQUID

FLASH POINT AT OR ABOVE 73°F, BUT BELOW 100°

123

Combustible Liquids

- Class II Liquid
- *Flash point at or above 100° F and below 140°F*
- *(Diesel Fuel and Heating Oil)*
- Class III Liquid
- *Flash point at or above 140°F*
- Class IIIA Liquid
- *Flash point at or above 140°F, but below 200°F*
- Class IIIB Liquid
- *Flash point at or above 200°F*

124

- **UNSTABLE LIQUID, LIQUID IN PURE STATE OR AS COMMERCIALLY PRODUCED OR TRANSPORTED, WILL VIGOROUSLY POLYMERIZE, DECOMPOSE, UNDERGO CONDENSATION REACTION, OR BECOME SELF-REACTIVE UNDER CONDITIONS OF SHOCK, PRESSURE, OR TEMPERATURE.**

125

Examples of unstable liquids

- Nitroglycerin
- Styrene
- Isoamyl Nitrite
- Cyclohexane

126

EQUIVALENCY CONTINUED

1-4.1 Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

127

RETROACTIVITY CONTINUED

- 1.4.1 Unless otherwise specified, or where specified, existing, approved to remain
- 1.4.2 Where AHJ determines that existing situation presents an unacceptable degree of risk, AHJ shall be permitted to apply retroactively any portion of this code deemed appropriate

128

OTHER CHAPTERS IN NFPA 30

- CHAPTER 5, GENERAL REQUIREMENTS (RESERVED)
- CHAPTER 6, FIRE AND EXPLOSION PREVENTION AND RISK CONTROL
  - INCLUDES SECTION ON EMERGENCY PLANNING AND TRAINING
  - WRITTEN EMERGENCY ACTION PLAN

129

- CHAPTER 7 ELECTRICAL SYSTEMS
  - REFERS BACK TO NFPA 70, National Electrical code
  - Table 7.3.3 refers to NFPA 70 for Electrical Area Classification, Division and Zone area
  - CHAPTER 8, (RESERVED)

130

ADDITIONAL CHAPTERS

- *CHAPTER 9*, STORAGE OF LIQUIDS IN CONTAINERS
- *CHAPTER 10*, STORAGE OF LIQUIDS IN CONTAINERS, MERCANTILE OCCUPANCIES
- *CHAPTER 11*, STORAGE OF LIQUIDS IN CONTAINERS, INDUSTRIAL OCCUPANCIES
- *CHAPTER 12*, STORAGE OF LIQUIDS IN CONTAINERS, STORAGE OCCUPANCIES
- *CHAPTER 13*, STORAGE OF LIQUIDS IN CONTAINERS DETACHED UNPROTECTED BUILDINGS

131

ADDITIONAL CHAPTERS

- *CHAPTER 14*, HAZARDOUS MATERIALS STORAGE LOCKERS
- *CHAPTER 15*, OUTDOOR STORAGE
- *CHAPTER 16*, AUTOMATIC FIRE PROTECTION FOR INSIDE LIQUID STORAGE AREAS (EXTENSIVE MATERIAL)
- *CHAPTER 17*, PROCESSING FACILITIES
- *CHAPTER 18*, DISPENSING, HANDLING, TRANSFER, AND USE OF LIQUIDS

132

ADDITIONAL CHAPTERS

- *CHAPTER 19,* SPECIFIC OPERATIONS
- *CHAPTER 20,* (RESERVED)
- *CHAPTER 21,* STORAGE OF LIQUIDS IN TANKS REQUIREMENTS FOR ALL STORAGE TANKS

133

CHAPTER 16 Automatic Fire Protection for Inside Liquid Storage areas

- Applies to inside storage of flammable and combustible liquids in containers, intermediate bulk containers and portable tanks as specified in Section 9.4
- Sec. 9.4 Acceptable Containers (ALL ARE SUBJECT TO ADDITIONAL REQUIREMENTS)
  - Metal containers
  - Plastic containers
  - Fiber drums
  - Rigid nonmetallic intermediate bulk containers
  - Glass containers

134

CHAPTER 16 Automatic Fire Protection for Inside Liquid Storage areas (continued)

- ***Numerous general requirements and extensive specific design criteria.***
- Protection criteria shall be determined based on:
  - Fig. 16.4.1(a) to (c) and
  - Tables 16.5.2.1 to 16.5.2.12

135

EXAMPLE

Fig. 16.4.1(a)

Follow path to proper protection table to employ

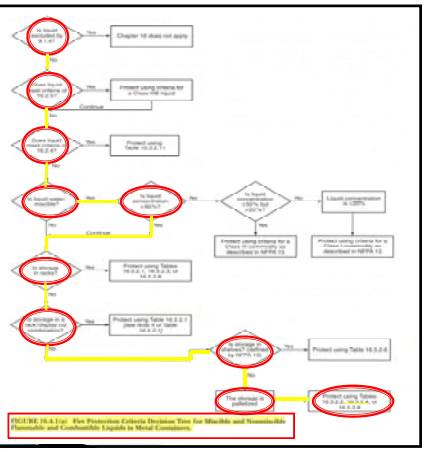


Table 16.5.2.4 Design Criteria for Foam-Water Sprinkler Protection of Palletized and Stacked Storage of Liquids in Metal Containers, Portable Tanks, and IBCs

Container Style and Capacity (gal)	Maximum Storage Height (ft)	Maximum Ceiling Height (ft)	Ceiling Sprinkler Protection: Sprinkler Type	Sprinkler Response	Design Density (gpm/ft²)	Design Area (ft²)	Notes	Fire Test Ref. [See Table D.2(d)]
NONRELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA								
≤5, cartoned	11	30	K≥11.2	SR or QR (HT)	0.40	3000	1	1
≤5, uncartoned	12	30	K≥8.0	SR or QR (HT)	0.30	3000	1	2
>5 and ≤60	5 (1 high)	30	K≥8.0	SR (HT)	0.30	3000	1	3
RELIEVING-STYLE CONTAINERS — LIQUID CLASSES IB, IC, II, IIIA								
>5 and ≤60	6.5 (2-high)	30	K≥8.0	SR (HT)	0.30	3000	2, 3	4
	10 (3-high)	33	K≥11.2	SR (HT)	0.45	3000	2, 3	6
	13.75 (4-high)	33	K≥11.2	SR (HT)	0.60	3000	2, 3	7
Portable tanks and IBCs	1- or 2-high	30	K≥8.0	SR (HT)	0.30	3000		5

For SI units, 1 gal = 3.8 L, 1 ft = 0.3 m, 1 ft² = 0.09 m², 1 gpm/ft² = 40.7 L/min/m² = 40.7 mm/min.
QR: Quick response sprinkler. SR: Standard response sprinkler. HT: High temperature.
Notes:
(1) Design area can be reduced to 2000 ft² when using a pre-primed foam-water system installed in accordance with NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, and maintained according to NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*.
(2) Both ½ in. (20 mm) and 2 in. (50 mm) listed pressure-relieving mechanisms are required on containers greater than 6 gal (23 L) capacity.
(3) Drums placed on open slatted pallet, not nested, to allow pressure relief from drums on lower levels.

CHAPTER 21 REQUIREMENTS FOR ALL STORAGE TANKS

- Applies to:
- Fixed tanks that exceed 60 gal. capacity.
- Portable tanks that exceed 660 gal.
- Intermediate bulk containers that exceed 793 gal.
- Design, installation, testing, operation, and maintenance of the above

138

- 21.3.1 Storage of class II & III heated above flash point, follow requirements for class I liquids (unless)
- An Engineering evaluation justifies following requirements for other liquid class.

139

PART 3

- TANK INSTALLATION

140

NORMAL VENTING FOR STORAGE TANKS, Sec. 21.4.3 TO 21.4.3.5, changed in 2012

- Vented to prevent vacuum or pressure buildup.
- Primary tank and each primary compartment vented
- Sized according to API 2000 or other approved standard.
- Alternatively, at least as large as largest filling or withdrawal connection
- In no case smaller than 1¼" ID.
- Atmospheric tanks max 1psi. Vac. Or pressure
- Vented to prevent overpressure from pump.

141

FILL PIPES

- Enter top, down to within 6 inches of bottom
- Vibration minimized
- Exceptions:
  - Vapor space not in flammable range
  - Minimal potential for accumulation of static charge

142

21.4.5.3 INTERNAL CORROSION PROTECTION FOR NONMETALLIC TANKS

- If tank degradation anticipated engineering analysis required

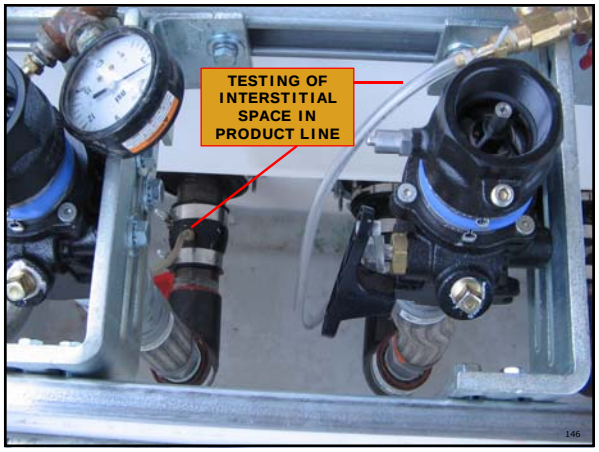
143

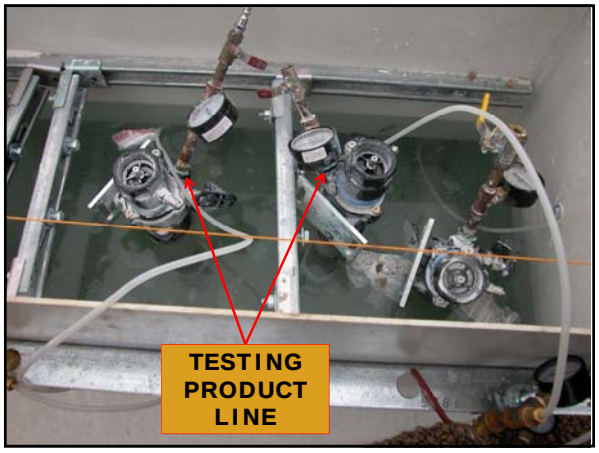
21.5 TESTING REQUIREMENTS FOR TANKS

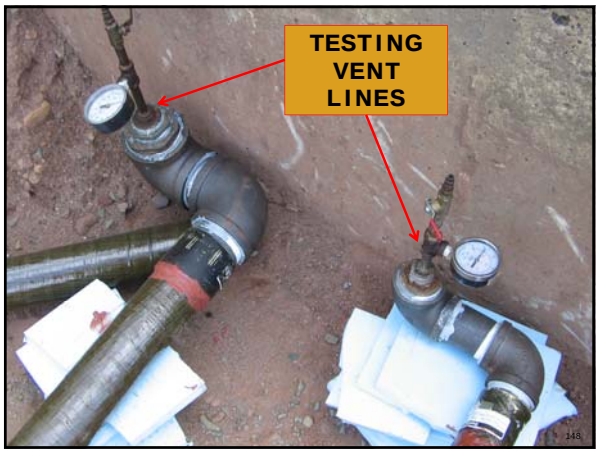
- All tanks shall be tested before they are placed in service according to the requirements of the code under which they were built.

144


145


TESTING OF INTERSTITIAL SPACE IN PRODUCT LINE
146


TESTING PRODUCT LINE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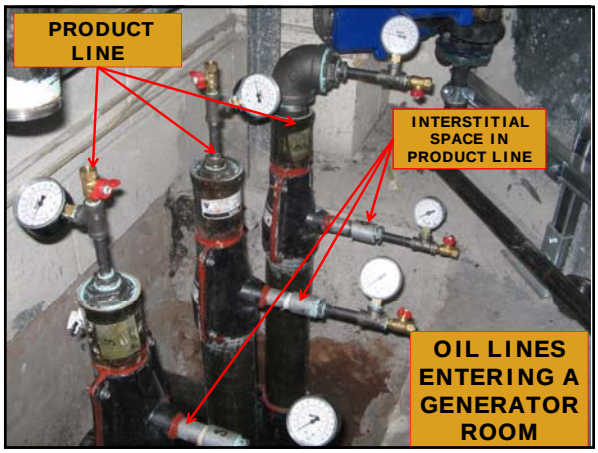


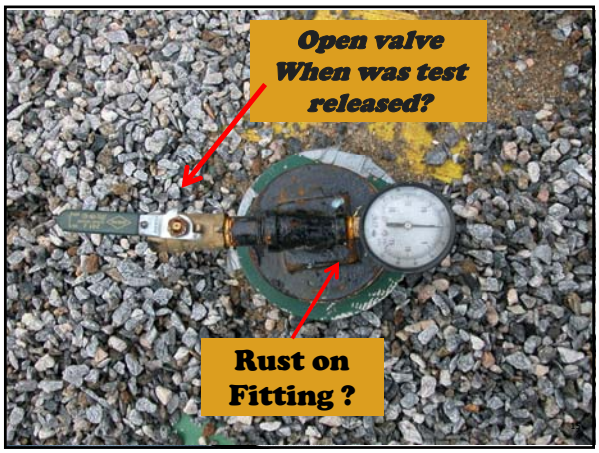
21.5.2.1 TIGHTNESS TESTING

- Tank testing not required if tank and interstitial space maintains factory test during installation.
  - Above ground until set in place
  - u/g until backfilled to top of tank

152

- Damaged Gage
- What was original factory test ?
- Can test be trusted ?
- What are tank manufacturer requirements

153



INSTALLATION OF UNDERGROUND TANKS, Sec. 23.4.2

- LOCATION, FOUNDATIONS
  - CLASS I LIQUIDS (gasoline), TANKS MIN. 1 FOOT FROM FOUNDATION
  - 3 FEET FROM ANY PROPERTY LINE THAT CAN BE BUILT ON
- CLASS II (diesel/fuel oil)OR III LIQUIDS, TANKS WALL, BASEMENT, PIT OR PROPERTY LINE 1 FOOT

155

- MAX COVER ALLOWED OVER TANK SPECIFIED BY TANK MANUFACTURER AND STAMPED ON TANK
- ALL TANK OPENINGS SHALL BE LIQUIDTIGHT (EXCEPT VENT)

156

BEDDING AND BACKFILL FOR UNDERGROUND TANKS 23.5.1

- SURROUNDED BY MIN. 12" OF NONCORROSIVE INERT MATERIAL.
- in 12 " to 18" vertical lifts ***or***
- PER MANUFACTURER
  - (USUALLY MORE MATERIAL AND FILTER CLOTH REQUIRED SEE MANUFACTURER'S INSTALLATION INSTRUCTIONS)

159

COVER FOR UNDERGROUND TANKS 23.5.2

- COVERED WITH 12" OF BACKFILL COVERED WITH 12" OF CLEAN EARTH OR
- 12" OF COMPACTED BACKFILL WITH 4" REINFORCED CONCRETE SLAB OR
- WHERE LIKELY SUBJECT TO TRAFFIC, 36" OF BACKFILL OR

161

COVER FOR UNDERGROUND TANKS CONTINUED

- 18" OF COMPACTED BACKFILL AND 6" OF REINFORCED CONCRETE OR
- AT LEAST 18" OF COMPACTED BACKFILL AND AT LEAST 8" OF ASPHALTIC CONCRETE
- CONCRETE OR ASPHALTIC CONCRETE TO EXTEND AT LEAST 12" BEYOND OUTLINE OF TANK

162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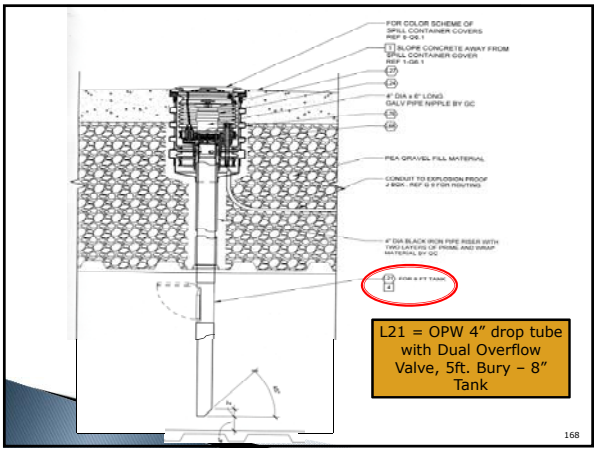
21.7.1.5 Operation of Storage tanks

- U/G tanks overfill prevention required
- When 90% full, trigger audible and visual high level alarm, or
- Automatically shut off flow of liquid flow when tank is no more than 95% full

166

167



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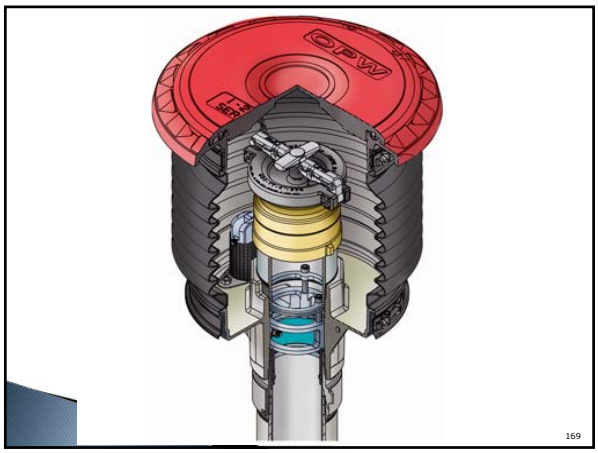


169

Chapter 22 Storage of Liquids in Tanks (above ground storage); Scope

- Fixed tanks that exceed 60 gallons
- Portable tanks that exceed 660 gallons
- Intermediate bulk containers that exceed 793 gallons
- Design, installation, testing, operation, and maintenance of such tanks

170

- SEE NFPA 31, 2011 ***"STANDARD FOR THE INSTALLATION OF OIL-BURNING EQUIPMENT"***
- SEC. 7.5 FOR NEW REQUIREMENTS FOR THE INSTALLATION OF OIL TANKS INSIDE BUILDINGS

171

- Fire resistant tanks shall be UL 2080 listed, *Standard for Fire Resistant Tanks for Flammable and Combustible Liquids,* or an equivalent test procedure
- Protected above ground tanks listed ANSI/UL 2085, *Standard for protected Aboveground Tanks for Flammable and Combustible Liquids,* or an equivalent test procedure

174

22.5.1 TANK SUPPORTS

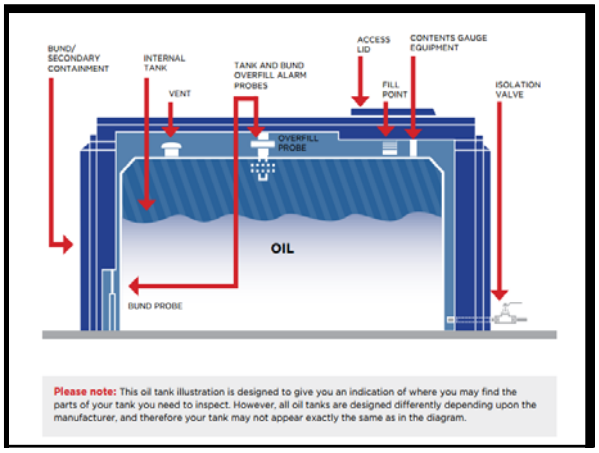
- TANK SUPPORTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH RECOGNIZED ENGINEERING STANDARDS OR APPROVED EQUIVALENTS
- EARTHQUAKE ZONES MUST BE CONSIDERED

176

177


178


179

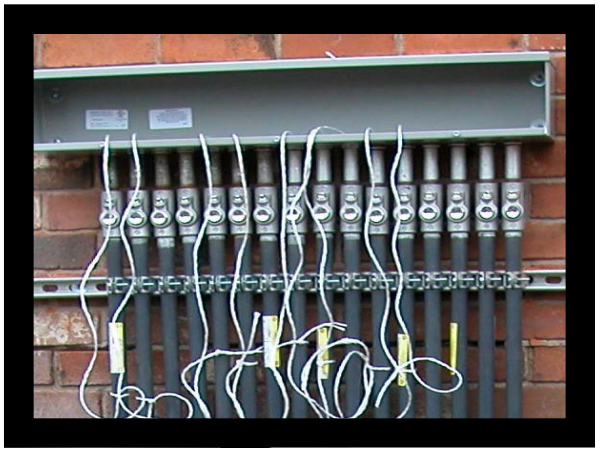

BUND/
SECONDARY
CONTAINMENT
INTERNAL
TANK
VENT
TANK AND BUND
OVERFILL ALARM
PROBES
ACCESS
LID
CONTENTS GAUGE
EQUIPMENT
FILL
POINT
ISOLATION
VALVE
OVERFILL
PROBE
OIL
BUND PROBE
Please note: This oil tank illustration is designed to give you an indication of where you may find the parts of your tank you need to inspect. However, all oil tanks are designed differently depending upon the manufacturer, and therefore your tank may not appear exactly the same as in the diagram.

22.7.3.10 Tank venting devices
(relief valves)

- Shall be marked with
  - Start to open pressure
  - Pressure at full open position
  - Flow capacity at full open pressure

181

182



EY, Explosion Proof Electrical Fittings

185

CONTROL OF SPILLS FROM ABOVEGROUND TANKS, Sec.22.11

- TANKS THAT CONTAIN CLASS I, CLASS II OR CLASS IIIA LIQUIDS
- PROVIDED WITH MEANS TO PREVENT ACCIDENTIAL RELEASE
- REMOTE IMPOUNDING
  - 1% SLOPE
  - CAPACITY OF LARGEST TANK
  - PATH AWAY FROM OTHER TANKS IN CASE OF FIRE
  - IMPOUND AREA 50 FEET FROM PROPERTY LINE
  - EXCEPTIONS

188

IMPOUNDING AROUND TANKS BY DIKING, Sec.22.11.2

- SLOPE OF 1% AWAY FROM TANK
- VOLUME OF AREA NOT LESS THAN LARGEST TANK
- FOR ACCESS OUTSIDE BASE NOT LESS THAN 10 FEET FROM PROPERTY LINE
- WALLS CONSTRUCTED OF EARTH, STEEL,CONCRETE OR SOLID MASONRY
- LIQUIDTIGHT
- MAX 6 FEET HIGH (with exceptions)
- DIVIDED IF MORE THAN ONE TANK IN AREA
- DRAINAGE WATER CONTROLLED
- STORAGE OF OTHER COMBUSTIBLE CONTAINERS IN AREA NOT PERMITTED
- MANY EXCEPTIONS

189

CHERNOBYL New Safe Confinement Building

ABOVEGROUND SECONDARY CONTAINMENT TANKS Sec.22.11.4

- MAX 12,000 GALLONS FOR CLASS I, AND 20,000 GAL FOR CLASS II & IIIA
- PIPING CONNECTIONS ABOVE NORMAL LIQUID LEVEL
- PREVENT RELEASE BY SIPHON
- LIQUID LEVEL INDICATOR REQUIRED AND MUST BE ACCESSIBLE TO DELIVERY OPERATOR
- 3 FEET SPACING BETWEEN TANKS
- IMPACT BARRIERS REQUIRED
- IF SECONDARY CONTAINMENT ENCLOSED, EMERGENCY VENTING REQUIRED
- SECONDARY CONTAINMENT DESIGNED TO WITHSTAND HYDROSTATIC HEAD RESULTING FROM LEAK

192

Chapter 23, Underground tanks

VENT PIPE SIZES , NORMAL VENTING U/G TANKS MINIMUM SIZES 23.6.2

VENT LINE DIAMETERS			
MAX. FLOW GPM.	LENGTH OF PIPE		
	50 FT.	100 FT.	200FT.
100	1 ¼	1 ¼	1 ¼
200	1 ¼	1 ¼	1 ¼
300	1 ¼	1 ¼	1 1/2
400	1 ¼	1 ½	2
500	1 ½	1 ½	2
600	1 ½	2	2
700	2	2	2
800	2	2	3
900	2	2	3
1000	2	2	3

196

198

Sec.23.14 Areas subject to flooding

- Tanks shall be anchored and secured by approved means
- Design of anchoring shall be based on buoyancy of an empty tank that is fully submerged
- Vents and other openings that are not liquid tight shall be extended above flood stage level

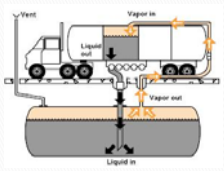
200

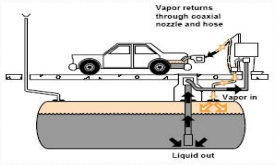
201

VAPOR RECOVERY 2013

- On June 18, 2013, Public Act No. 13-120 was signed into law and immediately became effective. This Act repealed the previous version of Connecticut General Statute Section 22a-174e, which required the Connecticut Department of Energy & Environmental Protection (DEEP) to adopt regulations pertaining to the installation and testing of Stage II vapor recovery systems and replaced it with language that mandates the decommissioning of all Stage II systems by July 1, 2015.

202





- **Stage I Vapor Control** is the control of gasoline vapor emissions that occurs when gasoline is delivered in bulk from tanker trucks to the underground storage tanks located at dispensing stations. **Stage I Vapor Recovery** is the system used to capture the vapors displaced from the underground storage tanks during these deliveries. The captured vapors are piped back into the empty space within the tanker truck so they can be returned to the terminal for processing.

- **Stage II Vapor Control** is the control of gasoline vapor emissions that occurs when vehicles are being fueled at gasoline dispensing stations. **Stage II Vapor Recovery** is the system used to capture the gasoline vapors at the vehicle fill pipe. The captured vapors are returned to the empty space in the underground storage tank at the dispensing station. The vapors stored in the underground storage tanks will later be transferred to the terminal for processing during the next bulk delivery via the Stage I Vapor Recovery system.

203

Connecticut Department of Energy & Environmental Protection
Bureau of Air Management
Engineering & Enforcement Division

- **Public Act No. 13-120 – An Act Concerning Gasoline Vapor Recovery Systems**
- **Fact Sheet**
- **Regulation** Public Act No. 13-120
- **Effective Date** June 18, 2013
- **What It Means** Public Act No. 13-120 repealed the previous version of Connecticut General Statute Section 22a-174e, which required the Connecticut Department of Energy & Environmental Protection (DEEP) to adopt regulations pertaining to the installation and testing of Stage II vapor recovery systems, and replaced it with language that mandates the decommissioning of all Stage II systems by July 1, 2015.
- **Overview Immediate Implications**
- On or after June 18, 2013, no owner of any Gasoline Dispensing Facility (GDF) shall install a Stage II vapor recovery system.
- The owner of any GDF with a Stage I vapor recovery system shall perform a pressure decay test of such system annually. Annually means the test has to be conducted once per calendar year. The Act also requires a Decay test to be conducted this year, 2013. Testing done for decommissioning purposes or for a Stage II test will satisfy the annual testing requirement for that year.
- On or before July 1, 2015, the owner of any GDF shall decommission any installed Stage II vapor recovery equipment.
- **Act Requirements Decommissioning**
- Must be completed on or before July 1, 2015 and it must be in accordance with subsection (c) of the Act, which requires:
- The owner shall notify the commissioner of their intent to decommission at least 30 days prior to decommissioning on a form provided by the commissioner
- Perform decommissioning in accordance with Section 14 of the 2009 "Recommended Practices for Installation and Testing of Vapor Recovery Systems at Vehicle Refueling Sites" of the Petroleum Equipment Institute Document (PEI/RP 300-09)
- Complete decommissioning within 100 days from initiation, unless the commissioner grants an extension of time for good cause
- Conduct testing as required in sections 14 (Decommissioning) and 8 (Decay Test) of the PEI/RP 300-09 document and submit testing notification 7 business days prior to the test on a form provided by the commissioner
- Submit a final Decommissioning Report within 10 days of the testing date, on a form provided by the commissioner

204

- **Annual Testing**
- The owner of any GDF with a Stage I vapor recovery system shall perform an annual pressure decay test of such system.
- The DEEP must be notified at least 7 business days prior to a scheduled test on a form provided by the commissioner

- **GDF Obligations Operate and Maintain**
- GDF owners that currently have Stage II systems installed must continue to maintain and operate the Stage II systems in accordance with the manufacturer's recommendations, CARB, any federal requirements, and/or section 30, unless they initiate the decommissioning process prescribed in the public act.
- **Stage II Testing**
- Owners of GDF's that currently are due for Stage II testing or will be prior to July 1, 2015 must still perform testing unless the owners initiate the decommissioning process prescribed in the Act, prior to their testing date.
- **Contact Info** Kathleen Rankin
- (860) 424-3473
- Engineering and Enforcement Division
- Bureau of Air Management
- Department of Energy and Environmental Protection
- 79 Elm Street
- Hartford, CT 06106-5127
- *This overview is designed to answer general questions and provide basic information. You should refer to the appropriate Public Act for the specific regulatory language*

205

- **The three forms needed to complete the decommissioning process:**
- Intent to Decommission Notification (Word , PDF)
- Pressure Decay Test Notification (Word , PDF)
- *The Pressure Decay Test Notification serves the following purposes: it is required to be used during the decommissioning process as well as annually upon the completion of the decommissioning process. It is also required for those Gasoline Dispensing Facilities that **still** maintain a Stage II vapor recovery system or for new/updated facilities that **did not** install a Stage II vapor recovery system.*
- Certification Report for a decommissioned Stage II Vapor Recovery System (Word , PDF)

206

(C) The installation and maintenance of underground components of new *facilities and the substantial modification of underground components of new or existing facilities shall be done in accordance with NFPA 30* and the manufacturer's specifications and recommendations. If provisions of NFPA 30 are inconsistent with the manufacturer's specifications or recommendations, the provision which imposes the most stringent and protective requirement shall control. Within thirty (30) days after completion of installation, the owner or operator shall submit to the commissioner a statement signed by

207

- The decommissioning of Stage II vapor Recovery Systems constitutes modification of underground components.
- Required to be done according to NFPA 30. CGS 449(d)-1(e)(C)
  - Substantial or not substantial ?
  - Permit or no permit ?

208

STORAGE TANK BUILDINGS, Sec.24.1.2

- APPLIES TO STORAGE TANKS FOR CLASS I, II, IIIA LIQUIDS
- FIRE IN BUILDING SHALL NOT CONSTITUTE EXPOSURE HAZARD TO ADJOINING BUILDINGS
- MAX CAPACITY 100,000 GALLONS
- DISTANCE TO PROPERTY LINES 15 FEET TO 200 FEET DEPENDING ON TANK SIZE AND CONTENTS
- DISTANCE TO PUBLIC WAY 5 TO 60 FEET DEPENDING ON TANK SIZE AND CONTENTS

209

CONSTRUCTION OF STORAGE TANK BUILDINGS, Sec.24.5

- 2 HOUR CONSTRUCTION
- EXCEPTIONS FOR SPRINKLERED BUILDINGS
- PROVIDE ADEQUATE ACCESS AND EGRESS
- CLASS I LIQUIDS, BASEMENTS TO HAVE MECHANICAL VENTILATION TO PREVENT ACCUMULATION OF FLAMMABLE VAPORS
- CLASS IA LIQUIDS, BUILDINGS DESIGNED TO DIRECT DEFLAGRATION AWAY, WITH DAMAGE LIMITING CONSTRUCTION PER *NFPA 68 Standard on Explosion Protection by Deflagration Venting*

210

STORAGE TANK BUILDINGS, Sec.24.6.2.3

- Where the need is indicated by the hazard of storage as determined by section 21.6.3 an approved extinguishing system shall be installed.
- Depending on type of liquid stored buildings shall be ventilated.

211

Sec. 24.13.5

- Vents for tanks in buildings shall terminate outside buildings

212

OTHER REQUIREMENTS FOR TANK BUILDING Sec. 24.14

- CONNECTIONS BELOW LIQUID LEVEL TO HAVE VALVES
- CLASS I OR II LIQUIDS, OPENINGS FOR MANUAL GAUGING SHALL BE PROVIDED WITH VAPORTIGHT CAP
- INLET FOR FILL AND OUTLET FOR VAPOR RECOVERY TO BE LOCATED OUTSIDE BUILDING 5 FEET FROM ANY BUILDING OPENING OR SOURCE OF IGNITION
- TANKS STORING CLASS I,II,IIA LIQUIDS SHALL HAVE OVERFLOW PROTECTION

213

CHAPTER 25, STORAGE TANK VAULTS

- NFPA 30 allows separation distances between property lines and other buildings which are not necessarily allowed by local building and zoning regulations.

214

CHAPTER 27, PIPING SYSTEMS

- Piping systems shall be maintained liquid tight.
- All pipes and fittings shall be ASME B31 *Code for pressure Piping,* designed
- Friction joints shall only be used outside above ground
- Exception for inside building
  - Located where leakage can be controlled by valve outside fire risk area
  - Strength of joints not dependent on combustible material

215

VENTS

- Vent outlets
  - Not located under eaves
  - 5 feet from building openings
  - 15 feet from powered ventilation intakes

216


217


218


NO FILL
219

CHAPTER 28 BULK LOADING AND UNLOADING FACILITIES FOR TANK CARS AND TANK VEHICLES

- Bonding for control of static electricity shall not be required where
  - Products do not have static accumulating properties (crude oils, residual oils, asphalts)
  - No Class I Liquids are handled
  - Tank cars or vehicles are loaded or unloaded through closed connections

220

- 28.9 Loading and unloading facilities shall be provided with drainage systems or other means to contain spills
- 28.10.1 Equipment used to transfer Class I liquids shall not be used for Class II or III liquids unless
  - Equipment cleaned between uses or
  - Water-miscible mixtures are transferred

221

- 28.10.2 remote pumps in u/g tanks shall have leak detection device installed on pump discharge side to indicate if piping is not essentially liquid-tight
- Tank vehicle engines shall be shutdown when
  - Transferring class I liquids
  - Transferring class II or III liquids above their flash points

222

CHAPTER 29 WHARVES

- This section shall not apply to:
- Marine service stations
- Marinas and boat yards covered in NFPA 303
- Liquefied petroleum products covered in NFPA 58 and NFPA 59A

223

- Hoses shall be compatible with liquids
- Each line conveying Class I or II liquids shall have readily accessible block valve located on shore
- Pipelines on wharves shall be bonded and grounded

224

QUESTIONS ?

225


THE END