

(26) "Noncondensibles" means gases and vapors from processes that are not condensed with the equipment used in those processes.

(27) "Petroleum" means the crude oil removed from the earth and the oils derived from tar sands, shale, coal and coke.

(28) "Petroleum liquid" means crude petroleum, petroleum, condensate and any finished or intermediate products manufactured or extracted in a petroleum refinery or in a facility which produces oils from tar sands, shale, coal or coke.

(29) "Petroleum refinery" means any facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants or other products through distillation of petroleum or through redistillation, cracking, extraction or reforming of unfinished petroleum derivatives.

(29m) "Process gas" means any gas generated by a petroleum refinery process unit except fuel gas and process upset gas as defined in this section.

(29p) "Process upset gas" means any gas generated by a petroleum refinery process unit as a result of startup, shutdown, upset or malfunction.

(30) "Refinery process unit" means any segment of a petroleum refinery in which a specific processing operation is conducted.

(31) "Reid vapor pressure" means the absolute vapor pressure of volatile crude petroleum and volatile nonviscous petroleum liquids except liquefied petroleum gases as determined by ASTM D323-89, incorporated by reference in ch. NR 484.

(32) "Splash filling" means the filling of a tank truck or stationary storage tank through a pipe or hose whose discharge opening is more than 15.2 centimeters (6 inches) above the bottom of the tank being filled.

(32m) "Top off" means to attempt to dispense more gasoline to a motor vehicle fuel tank after the vapor recovery dispensing nozzle has shut off.

(33) "True vapor pressure" means the equilibrium partial pressure exerted by a petroleum liquid as determined in accordance with methods described in American Petroleum Institute Publication 2517, *Evaporative Loss from External Floating Roof Tanks*, 3rd edition, February 1989, incorporated by reference in ch. NR 484.

(34) "Turnaround" means the procedure of shutting a refinery unit down after a run to do necessary maintenance and repair work and putting the unit back on stream.

(35) "Vacuum producing system" means any reciprocating, rotary, or centrifugal blower or compressor, or any jet ejector or device that takes suction from a pressure below atmospheric and discharges against atmospheric pressure.

(36) "Vapor balance system" means a combination of pipes or hoses which create a closed system between the vapor spaces of an unloading

tank and a receiving tank such that vapors displaced from the receiving tank are transferred to the tank being unloaded.

(37) "Vapor collection system" means, for the purpose of liquid organic compound transfer operations, a vapor transport system which uses direct displacement by the liquid loaded to force vapors from the tank into a vapor control system or vapor holding tank.

(38) "Vapor-mounted seal" means any primary floating roof seal mounted so that there is an annular vapor space underneath the seal. The annular vapor space is bounded by the bottom of the primary seal, the tank wall, the liquid surface, and the floating roof.

(38m) "Vapor recovery assist system" means a vapor control system which employs a pump, blower or other vacuum inducing device to collect or process vapors generated during motor vehicle fueling operations.

(39) "Vapor recovery or control system" means a system that gathers organic compound vapors released during the operation of any transfer, storage, or process equipment and processes the vapors so as to prevent their emission into the ambient air.

(39m) "Vapor tight" means having the detection of less than 10,000 ppm hydrocarbon concentration, as determined by Method 21 in Appendix A of 40 CFR part 60, incorporated by reference in ch. NR 484, at a distance of one inch from the source.

(40) "Wastewater (oil-water) separator" means any device or piece of equipment which utilizes the difference in density between oil and water to remove oil and associated chemicals from water. This includes any device, such as a flocculation tank, clarifier, etc., which removes petroleum derived compounds from wastewater.

(41) "Waxy, heavy pour crude petroleum" means a crude petroleum with a pour point of 10°C (50°F) or higher as determined by ASTM D97-87, incorporated by reference in ch. NR 484.

**History:** Renum. from NR 154.01, Register, September, 1986, No. 369, eff. 10-1-86; renum. (2), (3), (4), (7) and (12) to be NR 419.02 (1), 400.02 (11m), (16e), (21m) and (26m), r. (19), am. (21), (29m) and (29p) renum. from NR 420.02 (71) and (72), Register, February, 1990, No. 410, eff. 3-1-90; am. (31), (33) and (41), Register, May, 1992, No. 437, eff. 6-1-92; cr. (8m), (24m), (32m), (38m) and (39m), Register, January, 1993, No. 445, eff. 2-1-93.

**NR 420.03 Storage of petroleum liquids.** (1) **APPLICABILITY.** The storage, recordkeeping and maintenance requirements of subs. (2), (3) and (4) apply to all storage vessels for petroleum liquids of more than 151,412 liter (40,000 gallon) capacity on which construction or modification is commenced after July 1, 1975, with the exception of:

(a) Storage vessels being used for number 2 through number 6 fuel oils as specified in ASTM D396-89a, gas turbine fuel oils numbers 2-GT through 4-GT as specified in ASTM D2880-89, or diesel fuel oils numbers 2-D and 4-D as specified in ASTM D975-89a. These ASTM standards are incorporated by reference in ch. NR 484.

(b) Storage vessels for the crude petroleum or condensate stored, processed or treated at a drilling and production facility outside a standard metropolitan statistical area prior to custody transfer.

(c) Pressure vessels which are designed to operate at pressures in excess of 104 kPa (15 psig) without emissions except under emergency conditions.

(d) Subsurface caverns or porous rock reservoirs.

(e) Horizontal underground storage tanks used to store JP-4 jet fuel.

(2) **STORAGE REQUIREMENTS.** The owner or operator of any storage vessel to which this section applies shall store petroleum liquids as follows:

(a) If the true vapor pressure of the petroleum liquid, as stored, is equal to or greater than 10.5 kPa (1.52 psia) but not greater than 77 kPa (11.1 psia), the storage vessel shall be equipped with a floating roof, a vapor recovery system or an equally effective alternative control method approved by the department.

(b) If the true vapor pressure of the petroleum liquid, as stored, is greater than 77 kPa (11.1 psia), the storage vessel shall be equipped with a vapor recovery system or an equally effective alternative control method approved by the department.

(3) **RECORDKEEPING.** (a) *General records.* The owner or operator of any storage vessel to which this section applies shall, for each such storage vessel, maintain a file of each type of petroleum liquid stored, the typical Reid vapor pressure of each type of petroleum liquid stored and the dates of storage. Dates on which the storage vessel is empty shall be indicated.

(b) *Vapor pressure dependent records.* The owner or operator of any storage vessel to which this section applies shall, for each such storage vessel, determine and record the average monthly storage temperature and true vapor pressure of the petroleum liquid stored at such temperature if:

1. The petroleum liquid has a true vapor pressure, as stored, greater than 3.5 kPa (0.51 psia) but less than 10.5 kPa (1.52 psia) and is stored in a vessel other than one equipped with a floating roof, a vapor recovery system or their equivalents; or

2. The petroleum liquid has a true vapor pressure, as stored, greater than 63 kPa (9.1 psia) and is stored in a storage vessel other than one equipped with a vapor recovery system or its equivalent.

(c) *Vapor pressure determination.* The true vapor pressure shall be determined by application of the procedures in API Publication 2517, 3rd edition, incorporated by reference in ch. NR 484, in accord with this paragraph. This procedure is dependent upon determination of the average monthly storage temperature and the Reid vapor pressure, which requires sampling of the petroleum liquids in the storage vessels. Unless the department requires in specific cases that the stored petroleum liquid be sampled, the true vapor pressure may be determined by using the average monthly storage temperature and the typical Reid vapor pressure. For those liquids for which certified specifications limiting the Reid vapor pressure exist, that Reid vapor pressure may be used. For other liquids, supporting analytical data shall be made available on request to the department when typical Reid vapor pressure is used.

(4) **EQUIPMENT MAINTENANCE.** (a) *Applicability.* In addition to the vessels identified in sub. (1) this subsection applies to all storage vessels for petroleum liquids of more than 7,571 liter (2,000 gallon) capacity.

(b) *Requirements.* No person may place, hold or store in a storage vessel any petroleum liquid which has a true vapor pressure as stored greater than 10.5 kPa (1.52 psia) unless:

1. Any tank surface exposed to the rays of the sun is painted and maintained white so as to prevent excessive temperature and vapor pressure increases; and
2. The seals of any floating roof are maintained so as to minimize emissions; and
3. All gauging and sampling devices are vapor-tight except when gauging or sampling is taking place.

(5) **FIXED ROOF VESSELS.** (a) *Applicability.* This subsection applies, subject to the provisions of s. NR 425.03, to all fixed roof storage vessels with capacities greater than 151,412 liters (40,000 gallons) with the exception of those having capacities less than 1,600,000 liters (416,000 gallons) used to store crude petroleum and condensate prior to custody transfer.

(b) *Storage requirements.* No owner or operator of a fixed roof storage vessel to which this subsection applies may permit such storage vessel to be used for storing any petroleum liquid which has a true vapor pressure as stored greater than 10.5 kPa (1.52 psia), unless:

1. The vessel has been retrofitted with an internal floating roof equipped with a closure seal, or seals, to close the space between the roof edge and tank wall; or
2. The vessel has been retrofitted with equally effective alternative control, approved by the department; and
3. The vessel is maintained such that there are no visible holes, tears, or other openings in the seal or any seal fabric or materials; and
4. All openings, except stub drains, are equipped with covers, lids, or seals such that:
  - a. The cover, lid or seal is in the closed position at all times except when in actual use; and
  - b. Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports; and
  - c. Rim vents, if provided, are set to open when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting; and
5. Routine inspections are conducted through roof hatches at monthly intervals during the ozone season; and
6. A complete inspection of cover and seal is conducted whenever the tank is emptied or at least every 5 years, whichever is more frequent; and
7. Records are maintained and retained for a minimum of 2 years that shall include:

- a. The results of inspections conducted under subds. 5 and 6; and
- b. The information required under sub. (3).

(6) **EXTERNAL FLOATING ROOF VESSELS.** (a) *Applicability.* This subsection applies, subject to the provisions of s. NR 425.03 (4) or (5), to all storage vessels equipped with external floating roofs having capacities greater than 151,412 liters (40,000 gallons) with the exception of:

1. Storage vessels having capacities less than 1,500,000 liters (396,270 gallons) used to store crude petroleum and condensate prior to custody transfer.
2. Storage vessels used to store waxy, heavy pour crude petroleum.
3. Storage vessels used solely for petroleum liquids with a true vapor pressure of less than 10.5 kPa (1.52 psia).
4. Storage vessels used solely for petroleum liquids with a true vapor pressure of less than 27.6 kPa (4.0 psia), and which are of welded construction, and presently possess a metallic-type shoe seal, a liquid-mounted foam seal, a liquid-mounted liquid filled type seal, or equally effective alternative control, approved by the department.

5. Storage vessels of welded construction, equipped with metallic-type shoe primary seal which has a secondary seal from the top of the shoe seal to the tank wall.

(b) *Storage requirements.* No owner or operator of a storage vessel equipped with an external floating roof to which this subsection applies may permit such storage vessel to be used for storing any petroleum liquid unless:

1. The vessel has been fitted with a continuous secondary seal extending from the floating roof to the tank wall, or the vessel has been fitted with an equally effective alternative control, approved by the department; and
2. The vessel is maintained such that all seal closure devices meet the following requirements:
  - a. There are no visible holes, tears, or other openings in the seal or any seal fabric or material;
  - b. The seal or seals are intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall; and
  - c. For vapor-mounted seals, the accumulated area of gaps exceeding 0.32 cm (1/8 in) in width between the secondary seal and tank wall may not exceed 21.2 cm<sup>2</sup> per meter (1.00 in<sup>2</sup> per foot) of tank diameter; and
3. All openings in the external floating roof, except for automatic bleeder vents, rim space vents, and leg sleeves, are:
  - a. Equipped with covers, seals, or lids kept in the closed position except when in actual use; and
  - b. Equipped with projections into the tank which remain below the liquid surface at all times; and

4. Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports; and

5. Rim vents are set to open only when the roof is being floated off the leg supports or at the manufacturer's recommended setting; and

6. Emergency roof drains are provided with slotted membrane fabric covers or equivalent covers which cover at least 90% of the area of the opening; and

7. Routine visual inspections are conducted of all seals and seal closure devices at monthly intervals during the ozone season; and

8. The secondary seal gap of vapor-mounted seals is measured annually, in a manner approved by the department; and

9. Records are maintained and retained for a minimum of 2 years that shall include:

- a. The results of inspections conducted under subds. 7 and 8; and
- b. The information required under sub. (3) (a) and (b) (intro.).

(7) **EXTERNAL FLOATING ROOF VESSELS WITH NO SECONDARY SEAL REQUIREMENT.** (a) *Applicability.* This subsection applies to all storage vessels with capacities greater than 151,412 liters (40,000 gallons) equipped with external floating roofs operating without secondary seals or their approved equivalent pursuant to sub. (6) (a) 1 to 4.

(b) *Recordkeeping.* The owner or operator of a petroleum liquid storage vessel with an external floating roof not covered under sub. (6) but containing a petroleum liquid with a true vapor pressure greater than 7.0 kPa (1.0 psia), shall maintain and retain for at least 2 years records of the average monthly storage temperature, the type of liquid, throughput quantities and the maximum true vapor pressure for all petroleum liquids with a true vapor pressure greater than 7.0 kPa (1.0 psia).

(8) **ALTERNATIVE CONTROL.** Any alternative control method approved by the department under sub. (2), (5) (b) 2 or (6) (b) 1 shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

*History:* Renum. from NR 154.13 (2) (a) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (1) (intro.), (4) (b) (intro.) (5) (a), (b) (intro.) and 7. b., (6) (a) (intro.), (b) (intro.) and 2. c. and (7) (a), Register, February, 1990, No. 410, eff. 3-1-90; am. (1) (a) and (3) (c), Register, May, 1992, No. 437, eff. 6-1-92; am. (1) (e), (2) (a) and (b), (5) (b) 6., cr. (8), Register, December, 1993, No. 456, eff. 1-1-94.

**NR 420.035 Gasoline storage tank vent pipes.** (1) **APPLICABILITY AND EXEMPTIONS.** (a) *Applicability.* Except as provided in par. (b), this section applies to all stationary gasoline storage tanks at a gasoline dispensing facility with a total stationary storage tank capacity of 2000 gallons or more located in Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington or Waukesha county.

(b) *Non-highway fuel use exemption.* This section does not apply to any gasoline dispensing equipment that is used exclusively for fueling marine vessels, aircraft or snowmobiles.

(2) **VAPOR CONTROL REQUIREMENTS.** (a) No owner or operator of a gasoline dispensing facility described in sub. (1) (a) may permit gasoline to be transferred from either a gasoline delivery vessel to a stationary storage tank, or from a stationary storage tank to a motor vehicle fuel tank, unless the owner or operator has installed a pressure vacuum valve on the stationary gasoline storage tank vent pipe.

(b) The owner or operator of the gasoline dispensing facilities subject to par. (a) shall ensure that each pressure vacuum valve installed on a storage tank vent pipe is certified by the California air resources board under section 41954 of the California health and safety code, and is maintained in good working order.

(3) **COMPLIANCE SCHEDULE.** (a) The owner or operator of a gasoline dispensing facility subject to sub. (2) on August 1, 1994 shall install a pressure vacuum valve on each stationary gasoline storage tank vent pipe by March 31, 1995.

(b) The owner or operator of an existing gasoline dispensing facility previously exempt from the vapor control requirements of sub. (2) because its gasoline storage tank capacity was less than 2000 gallons shall install a pressure vacuum valve on each stationary gasoline storage tank vent pipe not later than 120 days after the exemption level is exceeded, making sub. (2) applicable.

(c) The owner or operator of a gasoline dispensing facility on which construction was commenced after August 1, 1994 and which is subject to the vapor control requirements of sub. (2) shall install a pressure vacuum valve on each stationary gasoline storage tank vent pipe before the tank is first filled with gasoline.

History: Cr. Register, July 1, 1994, No. 463, eff. 8-1-94.

**NR 420.04 Transfer operations and associated equipment.** (1) **BULK GASOLINE TERMINALS.** (a) *Applicability.* This subsection applies, subject to the provisions of s. NR 425.03, to all bulk gasoline terminals and the associated equipment necessary to load tank truck or trailer compartments.

(b) *Vapor control system.* No person may load gasoline into any tank trucks or trailers from any bulk gasoline terminal unless:

1. The bulk gasoline terminal is equipped with a vapor control system which is properly installed, in good working order, in operation and consisting of one of the following:

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