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charging, pushing, cleaning, and maintenance as determined by a one pass observation.

(e) Quench towers for the application of water on hot coke shall be equipped with grit arrestors or equivalent equipment approved by the department. Water used in quenching shall not include coke by-product plant effluent, and total dissolved solids in make-up quenching water shall be less than 750 milligrams per liter.

(f) Coke oven combustion stacks may not emit more than 0.10 pounds of particulate matter per 1000 pounds of exhaust gas or have visible emissions greater than 20% opacity.

History: Cr. Register, March, 1972, No. 195, eff. 4-1-72; r. and recr. (3) to (6), r. (7), Register, June, 1975, No. 234, eff. 7-1-75; emerg. am. (4) (b) 3, eff. 12-3-75; am. (4) (a) 1. a. and (4) (b) 3. (intro.), r. and recr. (4) (b) 3. a., Register, April, 1976, No. 244, eff. 5-1-76; am. (4) (a), Register, November, 1976, No. 251, eff. 12-1-76; r. and recr. (1) to (4), Register, September, 1979, No. 285, eff. 10-1-79; cr. (2) (d) and (e), (3) (f), (g) and (h), (4) (g), (h) and (i), Register, February, 1981, No. 302, eff. 3-1-81; am. (2) (b) and (c), (3) (c) to (e), (4) (c), (d) and (f), r. (2) (d) and (e), (3) (f) to (h), (4) (e) and (g) to (i), cr. (7), Register, August, 1981, No. 308, eff. 9-1-81; r. (2) (b) 1., ren. (2) (b) 2., 3. and 4. to be (2) (b) 1. to 3., renum. (2) (c) to be (2) (d) and am., cr. (2) (c), Register, March, 1982, No. 315, eff. 4-1-82; am. (2) (d) (intro.), 3. and 5., cr. (2) (e), Register, October, 1982, No. 322, eff. 11-1-82.

NR 154.12 Control of sulfur emissions. (1) **GENERAL LIMITATIONS.** No person shall cause, suffer, allow, or permit emission of sulfur or sulfur compounds into the ambient air which substantially contribute to the exceeding of an air standard or cause air pollution. The limitation on sulfur content of stand-by fuel is specified in s. NR 154.16 and the limitation on total reduced sulfur from pulping operations is specified in s. NR 154.18 (2).

(2) **SULFUR LIMITATIONS.** No person shall cause, suffer, allow, or permit sulfur dioxide to be emitted to the ambient air in amounts greater than:

(a) New or modified fossil fuel-fired steam generators rated at over 250 million BTU per hour:

1. Firing of liquid fossil fuel: 0.80 pounds of SO₂ per million BTU input.

2. Firing of solid fossil fuel: 1.2 pounds of SO₂ per million BTU input.

(b) New or modified sulfuric acid plants other than those utilized primarily as a means of preventing emission to the ambient air of sulfur dioxide or other sulfur compounds: 4.0 pounds of SO₂ per ton of acid produced.

(c) In the Southeast Wisconsin Intrastate AQCR installations of 250 million BTU per hour or less (heat input of an installation shall follow ASME standard number APS-1) in addition to meeting the emission limits of s. NR 154.11 (4), shall not burn coal with a sulfur content exceeding 1.11 pounds per million BTU in the coal.

(3) **PETROLEUM REFINERIES.** No person shall cause, suffer, allow or permit the release into the atmosphere or the burning of any fuel gas in an incinerator-waste heat boiler or process heater which contains greater than 0.10 grains of hydrogen sulfide (H₂S) per dry cubic foot at standard conditions (0.23 grams per dry cubic meter at standard condi-

tions) unless the gases resulting from combustion are treated in a manner which prevents the release of sulfur dioxide to the atmosphere as effectively as controlling the concentration of H_2S in the fuel gas being burned.

(4) **BROKAW RACT SULFUR LIMITATIONS.** (a) No person shall cause, allow or permit sulfur dioxide to be emitted to the ambient air within the geographical boundaries of the village of Brokaw, Marathon county from any direct source on which construction or modification was commenced prior to January 1, 1980 in amounts greater than:

1. Any liquid fossil fuel fired steam generating boiler:

a. Height above ground of emission point of less than 160 feet: that occurring from firing fuel oil with a sulfur content equal to or less than .22% by weight.

b. Height above ground of emission point of 160 feet or more: that occurring from firing fuel oil with a sulfur content equal to or less than 3.0% by weight.

2. Any Copeland recovery system: 113 pounds per hour.

3. Any pulp and papermill cooking acid plant: 22 pounds per hour.

4. Any pulp digester blow stack: 20 pounds per hour.

(b) When a source is subject to the emission limitations of par. (a), the owner or operator shall not exceed the following increments of progress in achieving compliance, commencing with the nonattainment determination under s. NR 154.03 (1):

1. Submit plans for achieving compliance within 6 months.

2. Award any necessary contract within 8 months.

3. Where physical alteration of the source is necessary to achieve compliance, commence construction within 10 months and complete construction within 20 months.

4. Where only fuel modification or switching is necessary to achieve compliance, commence operation using new fuel within 15 months.

5. Achieve final compliance with the applicable emission limitations and so certify to the department within 3 months of completion of construction or commencement of operation using new fuel.

6. Notwithstanding the increments of progress specified in this paragraph, all sources to which par. (a) applies shall achieve final compliance and so certify to the department on or before December 31, 1982.

(5) **MADISON RACT SULFUR LIMITATIONS.** (a) No person shall cause, allow or permit sulfur dioxide to be emitted to the ambient air within the geographical boundaries of the city of Madison, Dane county, from any direct source on which construction or modification was commenced prior to November 1, 1979 in amounts greater than:

1. Any fossil fuel fired steam generating boiler rated at more than 25 million BTU heat input per hour but less than 100 million BTU heat input per hour firing solid fossil fuel or solid fossil fuel in combination

with solid, liquid or gaseous fuels: 7.0 pounds of sulfur dioxide per million BTU heat input.

2. Any fossil fuel fired steam generating boiler rated at equal to or greater than 100 million BTU heat input per hour firing solid fossil fuel or solid fossil fuel in combination with solid, liquid or gaseous fuels:

a. Any electrical utility boiler: 4.25 pounds of sulfur dioxide per million BTU heat input.

b. Any other boiler:

1) Height above ground of emission point of less than 180 feet: 2.5 pounds of sulfur dioxide per million BTU heat input.

2) Height above ground of emission point of 180 to 220 feet: X pounds of sulfur dioxide per million BTU heat input, where $X = 10 [0.0089 (\text{Emission Point Height}) - 1.18]$.

3) Height above ground of emission point of more than 220 feet: 5.8 pounds of sulfur dioxide per million BTU heat input.

3. Any fossil fuel fired steam generating boiler rated at more than 25 million BTU heat input per hour firing liquid fossil fuel or liquid fossil fuel in combination with liquid or gaseous fuels:

a. Distillate fuel oil: that occurring from firing a distillate fuel oil with a sulfur content equal to or less than 0.5% by weight.

b. Residual fuel oil: that occurring from firing a residual fuel oil with a sulfur content equal to or less than 1.1% sulfur by weight.

(b) When a source is subject to the emission limitations of par. (a), the owner or operator shall not exceed the following increments of progress in achieving compliance, commencing with the nonattainment determination under s. NR 154.03 (1):

1. Submit plans for achieving compliance within 6 months.

2. Award any necessary contracts within 9 months.

3. Where physical alteration of the source is necessary to achieve compliance, commence construction within 12 months and complete construction within 30 months.

4. Where only fuel modification or switching is necessary to achieve compliance, commence operation using new fuel within 21 months.

5. Achieve final compliance with the applicable emission limitations and so certify to the department within 3 months of completion of construction or commencement of operation using new fuel.

6. Notwithstanding the increments of progress specified in this paragraph, all boilers to which par. (a) applies shall achieve final compliance and so certify to the department on or before December 31, 1982.

History: Cr. Register, March, 1972, No. 195, eff. 4-1-72; cr. (3), Register, June, 1975, No. 234, eff. 7-1-75; cr. (2) (c), Register, April, 1976, No. 244, eff. 5-1-76; cr. (5), Register, November, 1979, No. 287, eff. 12-1-79; cr. (4), Register, January, 1980, No. 289, eff. 2-1-80.

NR 154.13 Control of organic compound emissions. (1) GENERAL LIMITATIONS. (a) No person shall cause, allow or permit organic com-

pound emissions into the ambient air which substantially contribute to the exceeding of an air standard or cause air pollution.

(b) No person shall cause, allow or permit organic compounds to be used or handled without using good operating practices and taking reasonable precautions to prevent the spillage, escape or emission of organic compounds, solvents or mixtures. Such precautions shall include, but are not limited to:

1. Use of caution to prevent spillage or leakage when filling tanks, trucks or trailers.

2. Use of caution when filling automobile tanks to prevent spillage.

(c) Disposal of VOC wastes. 1. Effective August 1, 1979, no person shall cause, allow, or permit the disposal of more than 5.7 liters (1.5 gallons) of any liquid VOC waste, or of any liquid, semisolid or solid waste materials containing more than 5.7 liters (1.5 gallons) of any VOC, in any one day from a facility in a manner that would permit their evaporation into the ambient air during the ozone season. This includes, but is not limited to, the disposal of VOC which must be removed from VOC control devices so as to maintain the control devices at their required operating efficiency.

2. Disposal during the ozone season shall be by methods approved by the department, such as incineration, recovery for reuse, or transfer in closed containers to an acceptable disposal facility, such that the quantity of VOC which evaporates into the ambient air does not exceed 15% (by weight) or 5.7 liters (1.5 gallons) in any one day, whichever is larger.

(2) STORAGE OF ORGANIC COMPOUNDS. (a) Storage of petroleum liquids. 1. Applicability. a. The storage, monitoring and maintenance requirements of subds. 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:

- 1) Storage vessels being used for number 2 through number 6 fuel oils as specified in ASTM-D-396-73, gas turbine fuel oils numbers 2-GT through 4-GT as specified in ASTM-D-2880-71, or diesel fuel oils numbers 2-D and 4-D as specified in ASTM-D975-73.

Note: See American Society for Testing and Materials, Part 17, 1973. Copies of applicable standards from Part 17; Petroleum Products - Fuels, Solvents, Burner Fuel Oils, Lubricating Oils, Cutting Oils, Lubricating Greases, Hydraulic Fluids; are available for inspection at the offices of the department of natural resources, secretary of state and revisor of statutes, Madison, Wisconsin, and may be obtained for personal use from ASTM, 1916 Race Street, Philadelphia, PA 19103.

- 2) 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.

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

- 4) Subsurface caverns or porous rock reservoirs.

5) Underground tanks if the total volume of petroleum liquids added to and taken from a tank annually does not exceed twice the volume of the tank.

b. Effective July 1, 1980, the maintenance requirements of subd. 4. apply to all storage vessels for petroleum liquids of more than 7,571 liter (2,000 gallon) capacity.

c. Effective August 1, 1979, subd. 5. applies, subject to the provisions of sub. (12), 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.

d. Effective April 1, 1981, subd. 6. applies, subject to the provisions of sub. (12) (d) or (e), 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.

e. Effective April 1, 1981, subd. 7. applies to all storage vessels with capacities greater than 151,412 liters (40,000 gallons) equipped with external floating roofs without secondary seals or their approved equivalent.

2. Storage requirements. The owner or operator of any storage vessel to which this subdivision applies shall store petroleum liquids as follows:

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4. Process lines covered under sub. (8) (a) 1. on which construction or modification commenced on or after April 1, 1981 but before August 31, 1981 shall continue to comply with the requirements of sub. (11) (a) 2.c. during any interim period prior to the final compliance date in the applicable compliance schedule.

5. Where a source was not subject to the specific limitations of this section prior to the date specified in par. (a) 1., 2. or 3., the final compliance plan shall specify reasonable measures to minimize emissions of VOCs during the interim period prior to the final compliance date.

(h) New and modified sources. Any source on which construction or modification commenced on or after the date specified for such source in par. (a) 1., 2. or 3. shall meet the emission limitations of this section upon start-up unless the owner or operator of the source demonstrates, to the satisfaction of the department, that compliance upon start-up would be technologically infeasible. Such sources shall instead meet a department-specified compliance schedule which provides for interim emission limitations and for ultimate compliance with the emission limitations of this section. Ultimate compliance shall be as soon as practicable but in no event later than the date the source would have been required to meet under par. (b), (c), (d), (e) or (f) if it had been constructed or modified prior to the date specified in par. (a) 1., 2. or 3.

(13) EXCEPTIONS AND DEFERRALS. (a) Exceptions for certain organic compounds. For sources on which construction or modification is commenced on or before August 1, 1979, the provisions of subs. (2) (c), (3) (e) and (11) (a) shall not apply to the use or application of saturated halogenated hydrocarbons, perchloroethylene or acetone. In addition, none of the provisions of this section shall apply to the use or application of insecticides, pesticides or herbicides or to the use or emission of trichlorotrifluoroethane (freon 113), ethane or methane.

(b) Internal offsets. 1. No owner or operator of any surface coating or printing facility shall cause or allow the emission of VOCs from any coating or printing line to exceed the limitations contained in this section unless:

a. Each coating or printing line which is involved in the internal offset is operating with an emission rate of VOCs less than or equal to the adjusted emission rate for the coating or printing line (which may be a weighted daily average) contained in a compliance plan approved under this paragraph;

b. The construction or modification of the coating or printing line was commenced on or before:

1) August 1, 1979, for sources covered under subs. (4) (c) 1., (4) (d) 1., (4) (e) 1., (4) (f) 1., (4) (g) 1., (4) (h) 1., (4) (i) 1. and (4) (j) 1.; and

2) April 1, 1981, for sources covered under subs. (4) (k) 1., (4) (l) 1. and (4) (m) 1.; and

c. The combined emission rate from all coating or printing lines involved in the internal offset is less than or equal to an emission rate determined by the following equation:

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$$E = \frac{A_1 B_1 C_1}{D_1} + \frac{A_2 B_2 C_2}{D_2} + \dots + \frac{A_n B_n C_n}{D_n}$$

where E = the total allowable emission rate from all of the coating or printing lines involved in the internal offset in kilograms per hour (pounds per hour), $A_{1,2 \dots n}$ = the allowable emission rate for each coating or printing line pursuant to sub. (4) in kilograms per liter (pounds per gallon) of coating or ink, excluding water, delivered to the applicator, $B_{1,2 \dots n}$ = the amount of coating material or ink in liters per hour (gallons per hour), excluding water, delivered to the applicator, $C_{1,2 \dots n}$ = volume fraction of solids in the coating or ink, excluding water, delivered to the applicator, and $D_{1,2 \dots n}$ = theoretical volume fraction of solids, in the coating or ink necessary to meet the allowable emission rate for each coating or printing line pursuant to sub. (4) calculated from:

$$D_{1,2 \dots n} = 1 - \left(\frac{A_{1,2 \dots n}}{\text{density of solvent used in coating or ink delivered to applicator in kilograms per liter (pounds per gallon),}} \right)$$

and

d. The owner or operator has certified, and the department has confirmed, that the emissions of all air contaminants from all existing sources owned or controlled by the owner or operator in the state are in compliance with or under a schedule for compliance as expeditiously as practicable with, all applicable local, state and federal laws and regulations.

2. The provisions of subd. 1. apply to a surface coating or printing facility only after the department has approved a compliance plan which:

a. Specifies an emission rate for each of the coating or printing lines involved in the internal offset, and

b. Includes a compliance schedule consistent with sub. (12).

3. If, at any time, the department determines that one of these emission rates is being exceeded, approval of the compliance plan may be revoked and subd. 1. shall no longer apply to the facility.

4. The compliance plan required under subd. 2. shall include a compliance schedule consistent with sub. (12).

(c) Compliance schedule delays. Notwithstanding any compliance schedule approved or issued under sub. (12), the department may approve a new compliance schedule which provides additional time for completion of an increment of progress, provided:

1. That the owner or operator of the source is able to document to the department's satisfaction that the source is unable to meet the applicable deadline under sub. (12) for the increment of progress due to circumstances beyond the owner or operator's control which could not reasonably have been avoided by using all prudent planning;

2. Final compliance for sources covered under subs. (2) (a) 1.c., (3) (a) 1.a., (3) (b) 1.a., (3) (c) 1.a., (4) (c) 1., (4) (d) 1., (4) (e) 1., (4) (f) 1., (4) (h) 1., (4) (i) 1., (4) (j) 1., (6) (a) 1., (7) (a) 1., (7) (b) 1. and (7) (c) 1. is not later than December 31, 1982; and

3. For sources covered under subs. (2) (a) 1.d., (2) (b) 1., (3) (a) 1.b., (3) (b) 1.b., (3) (c) 1.b., (3) (e) 1., (4) (k) 1., (4) (l) 1., (4) (m) 1., (6) (b) 1., (7) (d) 1., (8) (a) 1. and (9) (a) 1. final compliance shall not exceed that required in sub. (12).

(d) Limitation of restrictions to the ozone season. Where the requirements of this section are met by means of a fossil-fuel fired incinerator, use of the incinerator shall be required only during the ozone season, provided that operation of the incinerator is not required for purposes of occupational health or safety or for the control of toxic or hazardous substances, malodors, or other pollutants regulated by other sections of this chapter. The provisions of this paragraph may be applied, subject to approval of the department, where the requirements of this section are met by use of other energy intensive control devices.

History: Cr. Register, March, 1972, No. 195, eff. 4-1-72; r. and recr., Register, June, 1975, No. 234, eff. 7-1-75; am. Register, July, 1979, No. 283, eff. 8-1-79; am. (3) (c) 2. and 4., Register, August, 1979, No. 284, eff. 9-1-79; am., Register, March, 1981, No. 303, eff. 4-1-81; cr. (12) (h) and am. (12) (a) (intro) and (g) 5., Register, July, 1981, No. 307, eff. 8-1-81.

NR 154.14 Control of carbon monoxide emissions. (1) **GENERAL LIMITATIONS.** No person shall cause, suffer, allow, or permit emission of carbon monoxide to the ambient air which substantially contribute to the exceeding of an air standard or cause air pollution.

(2) **CARBON MONOXIDE LIMITATIONS.** No person shall cause, suffer, allow, or permit significant emissions of carbon monoxide from any new direct source not listed below to be emitted to the ambient air unless such emissions are incinerated at 1,300°F for 0.3 seconds, or reduced by some other means an equivalent amount. Such emissions shall include, but are not limited to, the exhaust from cupolas, blast furnaces, basic oxygen furnaces; or waste streams from petroleum fluid cokers or other petroleum processes. Compliance with these limitations shall be shown to the department on initial startup of the source.

(a) Petroleum refineries (fluid catalytic cracking unit catalyst regenerators): 0.050% carbon monoxide by volume, dry basis.

History: Cr. Register, March, 1972, No. 195, eff. 4-1-72; am. (2) and cr. (2) (a), Register, June, 1975, No. 234, eff. 7-1-75.

NR 154.15 Control of nitrogen compound emissions. (1) **GENERAL LIMITATIONS.** No person shall cause, suffer, allow, or permit nitrogen oxides or nitrogen compounds to be emitted to the ambient air which substantially contribute to the exceeding of an air standard or cause air pollution.

(2) **NITROGEN OXIDES LIMITATIONS.** No person shall cause, suffer, allow, or permit nitrogen oxides (expressed as NO₂) to be emitted to the ambient air in amounts greater than:

(a) New or modified fossil fuel-fired steam generators rated at over 250 million BTU per hour:

1. Firing of gaseous fossil fuel; 0.20 pounds of NO₂ per million BTU input.
 2. Firing of liquid fossil fuel: 0.30 pounds of NO₂ per million BTU input.
 3. Firing of solid fossil fuel: 0.70 pounds of NO₂ per million BTU input.
- (b) New or modified weak nitric acid plants (acid 30 to 70% in strength:) 3.0 pounds of NO₂ per ton of acid produced.

History: Cr. Register, March, 1972, No. 195, eff. 4-1-72.

NR 154.16 Use of standby fuel. (1) Use of standby fuel shall meet the following limitations:

(a) Visible emissions:

1. The limits in visible emission shall be the same as section NR 154.11 (7) (c) of these rules.

(b) *Particulate emission limits:*

1. No person while burning standby fuel shall cause, suffer, allow, or permit to be emitted to the ambient air particulate matter which substantially contribute to the exceeding of an air standard or create air pollution.

(c) *Sulfur emission limits:*

1. In the Southeast Wisconsin Intrastate Air Quality Control Region, no person shall cause, suffer, allow, or permit use of standby fuel with greater sulfur content than:

- a. Coal: 1.50% (by weight as fired)
- b. Residual Oil: 1.00%
- c. Distillate Oil: 0.70%

2. Variance from the above sulfur limits may be granted by the department until July 1, 1975 or until existing fuel supplies are used.

History: Cr. Register, March, 1972, No. 195, eff. 4-1-72; am. (1) (a) and (c), Register, June, 1975, No. 234, eff. 7-1-75.

NR 154.17 Control of motor vehicles, internal combustion engines, and mobile sources. (1) **GENERAL LIMITATIONS.** No person shall cause, suffer, allow, or permit emissions of particulate matter, sulfur oxides, hydrocarbons, carbon monoxide, nitrogen oxides, or odors from a motor vehicle, internal combustion engine, or mobile source which substantially contribute to the exceeding of an air standard or create air pollution.