CR 92-76

WISCONSIN
DEPT. OF NATURAL RESOURCES

George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

101 South Webster Street
Box 7921
Madison, Wisconsin 53707
TELEPHONE 608-266-2621
TELEFAX 608-267-3579
TDD 608-267-6897

STATE OF WISCONSIN)
) ss
DEPARTMENT OF NATURAL RESOURCES)

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Bruce B. Braun, Deputy Secretary of the Department of Natural Resources and custodian of the official records of said Department, do hereby certify that the annexed copy of Natural Resources Board Order No. AM-12-92 was duly approved and adopted by this Department on August 20, 1992. I further certify that said copy has been compared by me with the original on file in this Department and that the same is a true copy thereof, and of the whole of such original.

RECEIVED
MAR 2 1993
2:30p
Revisor of Statutes
Bureau

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the Department at the Natural Resources Building in the City of Madison, this 23rd day of February, 1993.

Bruce B. Braun
Bruce B. Braun, Deputy Secretary

(SEAL)

6-1-93

Printed on Recycled Paper

RECEIVED
MAR 2 1993
Revisor of Statutes
Bureau

ORDER OF THE STATE OF WISCONSIN
NATURAL RESOURCES BOARD
REPEALING, RENUMBERING, AMENDING AND CREATING RULES

IN THE MATTER of **repealing** NR 440.17(2)(a)46. and (g), 440.36(6)(c) to (i), 440.445(6)(e) and (f) and 440.684(6), **renumbering** NR 439.075(2)(c)1.t. to w. and 3.d. to f., 440.02(12), 440.07(4) and (5), 440.26(2)(c) to (1), 440.36(6)(a) and Note, 440.445(6)(d), 440.48(6)(c), 440.57(6)(c), 440.58(6)(c), 440.63(6)(c), 440.684(2)(b)4., 5. and 6., 440.72(2)(a)6. to 10., 13. and 14., **renumbering and amending** NR 440.17(2)(a)47. to 55., (f) and (h), 440.72(2)(a)11. and 12., **amending** NR 439.06(2)(a), 439.075(2)(c)1.a., 2. and 5., 439.08(2)(b), 440.02(26), 440.08(2) and (5)(a), 440.17(1)(a)(intro.), 1. to 5., and (b), (2)(a)1., 6. to 11., 20., 34. to 40. and 42. to 45., (b)1., (c)1., (d)1. and (e)(intro.) and 1., 440.18(6)(a), (c), (e) and (f), 440.19(6)(c)3. and (f)1. to 3., 4.a. and 5.(intro.), 440.20(4)(h)1. and 2., (5)(a)1. and (c), (6)(d)3.(intro.) and (h), 440.205(1)(c), (2)(c), (k), (1) and (zb), (3)(a), (c), (d), (e), (f)(intro.) and 2. and (g), (4)(a)1.(intro.), (b), (e) and (f), (5)(a), (b), (f)1.(intro.), (g) and (h), (6)(b), (c)2.a. and b., 3.a. and 5. and (d)(intro.), (7)(c), (d)(intro.), 1. and 6.a. and c. and (f), (8)(a) and (b)2., (9)(b) and (f) and (10)(a)2., (b), (e), (g)(intro.), (m)2. to 4. and (o), 440.23(4)(b), 440.24(5)(a) and (b), 440.26(1) (title) and (b), and (6)(c) and (d), 440.27(2)(k) and (4)(b), 440.28(2)(j) and (6)(b), 440.285(1)(c) and (2)(f)(intro.) and (4)(a)2. and 4., 440.31(4)(b)5., 440.32(4)(a)1., 440.33(6)(b)2.a. and b., 440.34(6)(a)2.a. and b., 440.35(6)(a)2.a. and b., 440.37(4)(b), 440.38(4)(b), 440.39(4)(b), 440.40(2)(intro.) and (4)(b), 440.41(4)(b), 440.42(4)(b), 440.44(5)(i)4. and (7)(b), 440.445(7)(e), 440.46(2)(c), (d), (i) and (1) and (3)(a)2., 440.51(4)(e), 440.525(6)(c), 440.53(6)(c)(intro.), 440.57(2)(a)(intro.), 440.59(4)(d), 440.62(2)(a)1.c., (3)(b)(intro.) and (10)(a) Table A, 440.64(3)(h) and (7)(b), 440.642(3)(b)1.a., (4)(h)3.c. and (7)(i)4.b., 440.644(4)(b)1. and 2., (d)(intro.), (f)2.(intro.), and (j)(intro.) and 1., 440.67(4)(b)2. and (5)(a)2., 440.682(4)(b)3.a., 440.684(2)(a)4., (4)(b), (7)(a)2. and 4., (b)3., (c), (d)(intro.) and (e) and (8)(a), 440.688(3)(d) and (e)(intro.) and (7)(d),

AM-12-92

440.69(4)(b), 440.72(2)(a)1.a. and 4. and (5)(d), **repealing and recreating** NR 440.07(3)(intro.), 440.19(6)(c)1. and (g)(intro.) and (7), 440.20(7)(f), (h) and (i)(intro.), 1. and 2. and (8), 440.205(2)(zj), 440.21(5), 440.22(5), 440.23(4)(a) and (5), 440.24(5)(d) and (6), 440.25(4), 440.26(3)(intro.) and (a)(intro.), (4)(intro.) and (a) and (5)(intro.) and (a), (6)(title), (a) and (e) and (7), 440.29(4), 440.30(4), 440.31(5), 440.315(5), 440.32(5), 440.33(7), 440.34(7), 440.35(7), 440.37(5), 440.38(5), 440.39(5), 440.40(5), 440.41(5), 440.42(5), 440.43(7), 440.44(4)(c) and (6)(a) to (f), 440.445(4)(c) and (6)(a) to (c), 440.45(6), 440.46(7), 440.47(4), 440.48(6)(b), 440.50(6), 440.51(5), 440.52(5), 440.525(7), 440.53(6)(b), 440.54(5), 440.55(5), 440.565(8)(b), 440.57(6)(b), 440.59(5), 440.62(6), 440.63(6)(b), 440.64(4), 440.644(1)(a) and (b), 440.684(5), 440.688(6), 440.69(6), and **creating** NR 439.075(2)(c)3.j., k., l., m., and n., 440.02(12), 440.07(3)(am) and (4), 440.17(2)(a)56. to 61., (e)2., (f), (g) and (h), 440.20(7)(j), 440.205(3)(j), (5)(i),(j), and (k), (6)(j), (7)(g) and (h), (8)(f), (9)(i) and (10)(p) to (r), 440.207, 440.22(2)(b), (c) and (d), (4)(b), (c), (d) and (e) and (6), 440.26(1)(c), (d) and (e), (2)(c) to (f) and (q), (5)(b), (c), and (d), (8) and (9), 440.32(4)(b), (c), (d), and (e) and (6), 440.36(6)(a) and (b), 440.445(6)(d) to (f), 440.48(6)(c), 440.56(2)(b)10m., 440.565(8)(c), 440.57(6)(c), 440.58(6)(c) and (d), 440.62(4) Note, 440.63(6)(c), 440.644(3)(a) (title) and (b), (4)(b)4., (f)2.d. and (n), (6)(f), (7)(c)7., (i) and (j) and (8)(a)5., 440.647, 440.675, 440.684(2)(b)4., 440.686, 440.70, 440.71, 440.72(2)(a)6. and 440.74 of the Wisconsin Administrative Code, pertaining to incorporation of revisions and additions to the federal New Source Performance Standards.

Analysis Prepared by the Department of Natural Resources

Authorizing statutes: ss. 144.31(1)(a), 144.375(4), 144.38 and 227.11(2)(a), Stats.

Statute interpreted: ss. 144.31(1)(f), 144.375(4) and 144.38, Stats.

Under section 111 of the federal Clean Air Act, the Administrator of the United States Environmental Protection Agency (U.S. EPA) is required to adopt regulations establishing federal new sources performance standards (NSPS). These standards are adopted for categories of stationary air pollution sources which cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.

As of July 1, 1991, NSPS have been adopted for 77 source categories as set out in Title 40 of the Code of Federal Regulations, Part 60. Under section 111(c)(1) of the federal Clean Air Act, states may develop and submit to U.S. EPA procedures for implementing and enforcing the NSPS. If U.S. EPA finds the state procedures to be adequate, it may delegate to the state the authority to implement and enforce the standards. Wisconsin has received this delegation of authority.

Section 144.375(4)(a), Stats., states that if an NSPS is promulgated by U.S. EPA, the Department shall promulgate by rule a similar standard which may not be more restrictive in terms of emission limitations than the federal standard. The Department's last NSPS update, which took effect on October 1, 1990, adopted the federal NSPS which had been promulgated by U.S. EPA through July 1, 1988. The rules contained in this order adopt the changes to the federal NSPS occurring between July 1, 1988 and July 1, 1991, with one exception. The federal NSPS for Municipal Waste Combustors which was promulgated by U.S. EPA on February 11, 1991 is not included in this rule package as U.S. EPA is expected to extensively modify these requirements. The rules contained in this order includes modifications to existing standards and the adoption of standards for new categories of sources. In accordance with section 227.14(1m), Stats., the format for these rules is based on the format used in 40 CFR Part 60, the federal NSPS.

The rules contained in this order are proposed to comply with section 144.375(4)(a), Stats., and to enable U.S. EPA to continue delegation to the state of its authority to implement and enforce the present NSPS. Under s. 227.14(1m) the rules in this order use the format of the federal regulations in 40 CFR part 60.

This order also includes changes to update references to sections of ch. NR 440 in ch. NR 439 and minor changes in language to correct errors, improve clarity, and improve consistency within ch. NR 440 and with the other chapters of the NR 400 series.

SECTION 1. NR 439.06(2)(a) is amended to read:

NR 439.06(2)(a) Perform compliance emission testing following Method 6, 6A, 6B, 6C or 8 in 40 CFR part 60, Appendix A, incorporated by reference in ch. NR 484, or

SECTION 2. NR 439.075(2)(c)1.t. to w. are renumbered 430.075(2)(c)1.u., v., w. and t.

SECTION 3. NR 439.075(2)(c)3.d. to f. are renumbered 430.075(2)(c)3.e., f. and d.

SECTION 4. NR 439.075(2)(c)3.j., k. and l. are created to read:

NR 439.075(2)(c)3.j. Control devices at synthetic organic chemical manufacturing facilities subject to the requirements of s. NR 440.675 or 440.686.

k. Control devices at facilities subject to the magnetic tape coating requirements of s. NR 440.71.

l. Control devices at facilities subject to the polymeric coating of supporting substrate requirements of s. NR 440.74.

SECTION 5. NR 439.08(2)(b) is amended to read:

NR 439.08(2)(b) Sulfur content in liquid fossil fuel. The sulfur content of a liquid fossil fuel sample shall be determined according to ASTM D129-64(1978), Sulfur in Petroleum Products (General Bomb Method) ~~and~~, ASTM D1552-83, Standard Test Method for Sulfur in Petroleum Products (High-Temperature Method) or ASTM D4294-83, Sulfur in Petroleum Products by Nondispersive X-ray Fluorescence Spectrometer, incorporated by reference in ch. NR 484.

SECTION 6. NR 440.02(12) is renumbered NR 440.02(13).

SECTION 7. NR 440.02(12) is created to read:

NR 440.02(12) "Excess emissions and monitoring system performance report" means a report that must be submitted periodically by a source in order to provide data on its compliance with stated emission limits and operating parameters, and on the performance of its monitoring systems.

SECTION 8. NR 440.02(15m) is created to read:

NR 440.02(15m) "Method X," where "X" is a number or a number followed by a letter, means the specified method contained in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17.

SECTION 9. NR 440.02(26) is amended to read:

NR 440.02(26) "Reference method" means any method of sampling and analyzing for an air pollutant as ~~described in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17~~ specified in the applicable section.

SECTION 10. NR 440.07(3)(intro.) is repealed and recreated to read:

NR 440.07(3)(intro.) Each owner or operator required to install a continuous monitoring system (CMS) or monitoring device shall submit an excess emissions and monitoring systems performance report, excess emissions are defined in applicable sections, or a summary report form as described in sub. (4), or both, to the department semiannually, except when: more frequent reporting is specifically required by an applicable section; or the CMS data are to be used directly for compliance determination, in which case quarterly reports shall be submitted; or the department, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the new source. All reports shall be postmarked by the 30th day following the end of each calendar half, or quarter, as appropriate. Written reports of excess emissions shall include the following information:

SECTION 11. NR 440.07(3)(am) is created to read:

NR 440.07(3)(am) The process operating time during the reporting period.

SECTION 12. NR 440.07(4) and (5) are renumbered NR 440.07(5) and (6).

SECTION 13. NR 440.07(4) is created to read:

NR 440.07(4) The summary report form shall contain the information and be in the format shown in figure 1 unless otherwise specified by the department. One summary report form shall be submitted for each pollutant monitored at each affected facility.

(a) If the total duration of excess emission for the reporting period is less than 1% of the total operating time for the reporting period and CMS downtime for the reporting period is less than 5% of the total operating time for the reporting period, only the summary report form shall be submitted and the excess emissions and monitoring system performance report described in sub. (3) need not be submitted unless requested by the department.

(b) If the total duration of excess emission for the reporting period is 1% or greater of the total operating time for the reporting period or the total CMS downtime for the reporting period is 5% or greater of the total operating time for the reporting period, the summary report form and the excess emissions and monitoring system performance report described in sub. (3) shall both be submitted.

Figure 1 -- Summary Report -- Gaseous and Opacity Excess Emission and Monitoring System Performance

Pollutant (circle One -- $SO_2/NO_x/TRS/H_2S/CO/$Opacity)

Reporting period dates: From _______ to ________

Company:

Emission Limitation ____

Address:

Monitor Manufacturer and Model No. _________

Date of Latest CMS Certification or Audit _____
Process Unit(s) Description:

Total source operating time in reporting period[1]. _________________________

Emission data summary[1]

1. Duration of excess emissions in reporting period due to:
   a. Startup/shutdown
   b. Control equipment problems
   c. Process problems
   d. Other known causes
   e. Unknown causes
2. Total duration of excess emission
3. Total duration of excess emissions × (100) [Total source operating time] (%[2]):

CMS performance summary[1]

1. CMS downtime in reporting period due to:
   a. Monitor equipment malfunctions
   b. Non-monitor equipment malfunctions
   c. Quality assurance calibration
   d. Other known causes
   e. Unknown causes
2. Total CMS downtime

3. [Total CMS downtime] × (100) [Total source operating time] (%[2]):

[1] For opacity, record all times in minutes. For gases, record all times in hours.

[2] For the reporting period: If the total duration of excess emissions is 1% or greater of the total operating time or the total CMS downtime is 5% or greater of the total operating time, both the summary report form and the excess emission report described in §60.7(c) shall be submitted.

On a separate page, describe any changes since last quarter in CMS, process or controls. I certify that the information contained in this report is true, accurate, and complete.

Name ______________________________

Signature ______________________________

Title ______________________________

Date ______________________________

SECTION 14. NR 440.08(2)(intro.) and (5)(a) are amended to read:

NR 440.08(2)(intro.) Performance tests shall be conducted and data reduced in accordance with the test methods and procedures contained in each applicable section of this chapter unless the department specifies or approves, in specific cases, the use of a reference method with minor changes in methodology, or waives the requirement for performance tests because the owner or operator of a source has demonstrated by other means to the department's satisfaction that the affected facility is in compliance with the standard, or the department approves shorter sampling times and smaller sampling volumes when necessitated by process variables, or unless the administrator:

(5)(a) Sampling ports adequate for test methods applicable to the facility. This includes:

1. Constructing the air pollution control system such that the volumetric flow rates and pollution emission rates can be accurately determined by applicable test methods and procedures, and

2. Providing a stack or duct free of cyclonic flow during performance tests, as demonstrated by applicable test method procedures.

SECTION 15. NR 440.17(1)(a)(intro.), 1. to 5., and (b) are amended to read:

NR 440.17(1)(a) Federal regulations. The federal regulations in effect on July 1, ~~1988~~ 1991 listed in this paragraph are incorporated by reference ~~in~~ for the corresponding sections noted. Copies of these regulations are available for inspection in the offices of the department of natural resources, secretary of state and revisor of statutes, Madison, Wisconsin, or may be purchased for personal use from the superintendent of documents, U.S. government printing office, Washington, D.C. 20402.

1. 40 CFR s. 51.18 for ~~s~~ ss. NR 440.205(2)~~(1)~~(l) and 440.207(2)(k).
2. 40 CFR s. 51.24 for ~~s~~ ss. NR 440.205(2)~~(1)~~(l) and 440.207(2)(k).
3. 40 CFR s. 52.21 for ~~s~~ ss. NR 440.205(2)~~(1)~~(l)and 440.207(2)(k).
4. 40 CFR s. 60.11(e) for s. NR 440.59(5)~~(k)~~(f) Note.
5. 40 CFR s. 60.484 for ss. NR 440.62(3)(a)3 ~~and (6)(b)(intro.)~~, 440.647(4)(c) and 440.66(3)(c).

(b) Appendices. Appendices A, B, C and F of 40 CFR part 60 and Appendix B of 40 CFR part 61 as in effect on July 1, ~~1988~~ 1991 are incorporated by reference and made a part of this chapter. Copies of these appendices are available for inspection in the offices of the department of natural resources, secretary of state and revisor of statutes, Madison, Wisconsin, or may be purchased for personal use from the superintendent of documents, U.S. government printing office, Washington, D.C. 20402.

SECTION 16. NR 440.17(2)(a)1., 6. to 11., 20., 34. to 40. and 42. to 45. are amended to read:

NR 440.17(2)(a)1. ASTM D388-77, Standard Specification for Classification of Coals by Rank, for ss. NR 440.19(2)(a) and (6)(f)4 a, b and f, 440.20(2)(b), (n) and (y), 440.205(2)(d) and (t) ~~and~~, 440.207(2) and 440.42(2)(a) and (b).

6. ASTM D1946-77, Standard Method for Analysis of Reformed Gas by Gas Chromatography, for ~~s~~ ss. NR 440.18(6)(a), 440.19(6)(f)5 a, 440.647(6)(f), 440.675(5)(d)3 b and (d)5 and 440.686(5)(d)2 b and (d)4.

7. ASTM D2015-77, Standard Test Method for Gross Calorific Value of Solid Fuel by the Adiabatic Bomb Calorimeter, for s. NR 440.19(6)(f)5 b and (7)~~(g)~~(c)2 and for 40 CFR part 60, Appendix A, Method 19.

8. ASTM D1826-77, Standard Test Method for Calorific Value of Gases in Natural Gas Range by Continuous Recording Calorimeter, for ss. NR 440.19(6)(f)5 b and (7)~~(g)~~(c)2 and 440.46(7)(b)3, and for 40 CFR part 60, Appendix A, Method 19.

9. ASTM D240-76, Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter, for ss. NR 440.19(7)~~(g)~~(c)2 and 440.46(7)~~(f)~~(b)3, and for 40 CFR part 60, Appendix A, Method 19.

10. ASTM D396-78, Standard Specifications for Fuel Oils, for ss. NR 440.205(2)(h) and (zf), 440.207(2), 440.27(2)(g) and 440.28(2)(f).

11. ASTM D2880-78, Standard Specification for Gas Turbine Fuel Oils, for ss. NR 440.27(2)(g), 440.28(2)(f), and 440.50(6)~~(b)2~~(d).

20. ASTM D1072-80, Standard Method for Total Sulfur in Fuel Gases, for s. NR 440.50(6)~~(b)2~~(d).

34. ASTM E169-63 (reapproved 1977), General Techniques of Ultraviolet Quantitative Analysis, for ss. NR 440.62(6)(d)1, 440.66(4)(b) and 440.682(3)(f).

35. ASTM E168-67 (reapproved 1977), General Techniques of Infrared Quantitative Analysis, for ss. NR 440.62(6)(d)1, 440.66(4)(b) and 440.682(3)(f).

36. ASTM E260-73, General Gas Chromatography Procedures, for ss. NR 440.62(6)(d)1, 440.66(4)(b), 440.682(3)(f) and 440.684~~(6)(a)8~~(5)(b)3.

37. ASTM D2879-83, Test Method for Vapor Pressure - Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope, for ss. NR 440.285(2)(f)3, (7)(e)3 b and (f)2 a and 440.62(6)(e)1.

38. ASTM D2382-76 (reapproved 1980), Heat of Combustion of Hydrocarbon Fuels by Bomb Calorimeter (High-Precision Method), for ss. NR 440.18(6) ~~and~~, 440.62(6)(g)6, 440.647(6)(f), 440.675(5)(d)5 and 440.686(5)(d)4.

39. ASTM D2504-67 (reapproved 1977), Noncondensable Gases in C_3 and Lighter Hydrocarbon Products by Gas Chromatography, for s. NR 440.62(6)(g)5.

40. ASTM D86-78, Distillation of Petroleum Products, for ss. NR 440.647(4)(d), 440.66(4)(d) and 440.682(4)(h).

42. ASTM D3031-81, Standard Test Method for Total Sulfur in Natural Gas by Hydrogenation, for s. NR 440.50(6)~~(b)2~~(d).

43. ASTM D4084-82, Standard Method for Analysis of Hydrogen Sulfide in Gaseous Fuels (Lead Acetate Reaction Rate Method), for s. NR 440.50(6)~~(b)2~~(d).

44. ASTM D3246-81, Standard Method for Sulfur in Petroleum Gas by Oxidative Microcoulometry, for s. NR 440.50(6)~~(b)2~~(d).

45. ASTM D2584-68 (reapproved 1985), Standard Test Method for Ignition Loss of Cured Reinforced Resins, for s. NR 440.69(6)~~(e)~~(c)3 a.

SECTION 17. NR 440.17(2)(a)46. is repealed.

SECTION 18. NR 440.17(2)(a)47. to 55. are renumbered 440.17(2)(a)46. to 54. and 46. and 49., as renumbered, are amended to read:

NR 440.17(2)(a)46. ASTM D3431-80 (reapproved 1987), Standard Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons (Microcoulometric Method), for s. NR 440.205(10)(e)~~3~~.

49. ASTM D1835-86, Standard Specification for Liquified Petroleum (LP) Gases, ~~to be approved~~ for ~~s~~ ss. NR 440.205(2)(y) and 440.207(2).

This leaves no 55.

SECTION 19. NR 440.17(2)(a)56. to 61. are created to read:

NR 440.17(2)(a)56. ASTM D129-64 (reapproved 1978), Standard Test Method for Sulfur in Petroleum Products (General Bomb Method), for s. NR 440.26(7)(j)2.

57. ASTM D1552-83, Standard Test Method for Sulfur in Petroleum Products (High-Temperature Method), for s. NR 440.26(7)(j)2.

58. ASTM D2622-87, Standard Test Method for Sulfur in Petroleum Products by X-Ray Spectrometry, for s. NR 440.26(7)(j)2.

59. ASTM D1266-87, Standard Test Method for Sulfur in Petroleum Products (Lamp Method), for s. NR 440.26(7)(j)2.

60. ASTM D2908-74, Standard Practice for Measuring Volatile Organic Matter in Water by Aqueous-Injection Gas Chromatography, for s. NR 440.647(6)(j).

61. ASTM D3370-76, Standard Practices for Sampling Water, for s. NR 440.647(6)(j).

SECTION 20. NR 440.17(2)(b)1., (c)1., (d)1. and (e)(intro.) and 1. are amended to read:

NR 440.17(2)(b)1. AOAC Method 9, Official Methods of Analysis of the Association of Official Analytical Chemists, 11th edition, 1970, pp. 11-12, for ss. NR 440.37(5)~~(d)2.~~(b)3 b, 440.38(5)~~(d)2.~~(b)3 b, 440.39(5)~~(d)2.~~(b)3 b, 440.40(5)~~(d)2.~~(b)3 b, and 440.41(5)~~(f)2.~~(c)3 b.

(c)1. API Publication 2517, Evaporation Loss from External Floating-Roof Tanks, Second Edition, February 1980, for ss. NR 440.27(2)(k) and (4)(b), 440.28(2)(j) and (6)(b), and ~~440.46(2)~~ 440.285(2)(f)1 and (7)(e)2 a.

(d)1. TAPPI Method T624 os-68, for s. NR 440.45(6)(d)~~4.~~3.

(e)(intro.) The following material is available for purchase from the ~~Water Pollution Control Federation (WPCF), 2626 Pennsylvania Avenue N.W.,~~ American Public Health Association, 1015 15th Street NW, Washington~~, D.C. 20037~~ DC 20005.

1. Method ~~209A~~ 2540 B., Total ~~Residue~~ Solids Dried at 103-105°C, in Standard Methods for the Examination of Water and Wastewater, ~~15th~~ 17th edition, ~~1980~~ 1989, for s. NR 440.69(4)(b).

SECTION 21. NR 440.17(2)(e)2. is created to read:

NR 440.17(2)(e)2. Method 2540 G., Total, Fixed, and Volatile Solids in Solid and Semisolid Samples, in Standard Methods for the Examination of Water and Wastewater, 17th edition, 1989, for s. NR 440.32(5)(b)5.

SECTION 22. NR 440.17(2)(f) is renumbered 440.17(2)(i) and as renumbered is amended to read:

NR 440.17(2)(i) The following material is available from the ~~U.S. government printing office, Washington, D.C. 20402~~ National Technical Information Service, 5285 Port Royal Road, Springfield VA 22161.

1. The Standard Industrial Classification Manual, ~~1972, as amended by the 1977 Supplement (U.S. government printing office stock numbers 4101 0066 and 003 005 00176 0, respectively)~~ 1987, NTIS order no. PB 87-100012, for ss. NR 440.205(2)(c) and (zb), 440.46(2)(c), (d), (i) and (1) and 440.72(2)(a)1.

SECTION 23. NR 440.17(2)(g) is repealed.

SECTION 24. NR 440.17(2)(h) is renumbered 440.17(2)(j) and as renumbered is amended to read:

NR 440.17(2)(j) The following material is available for purchase from the Industrial Press Inc., ~~93 Worth St.~~ 200 Madison Ave., New York~~, New York~~ NY 10016 : Gas Engineers Handbook, 1st edition, 2nd printing, 1966, page 6/25, Fuel Gas Engineering Practice, for s. NR 440.684(9).

SECTION 25. NR 440.17(2)(f), (g) and (h) are created to read:

NR 440.17(2)(f) The following material is available for purchase from the following address: Underwriter's Laboratories, Inc. (UL), 333 Pfingsten Road, Northbrook IL 60062.

1. UL 103, Sixth Edition revised as of September 3, 1986, Standard for Chimneys, Factory-built, Residential Type and Building Heating Appliance.

(g) The following material is available for purchase from the following address: West Coast Lumber Inspection Bureau, 6980 SW Barnes Road, Portland OR 97223

1. West Coast Lumber Standard Grading Rules No. 16, pages 5-21 and 90 and 91, September 3, 1970, revised 1984.

(h) The following material is available for purchase from the following address: The American Society of Mechanical Engineers, 22 Law Dr., Box 2350, Fairfield NJ 07007-2350.

1. ASME Power Test Codes 4.1, August 8, 1972, for s. NR 440.205(7)(g).

SECTION 26. NR 440.18(6)(a), (c), (e) and (f) are amended to read:

NR 440.18(6)(a) Reference Method 22 of Appendix A, 40 CFR part 60, incorporated by reference in s. NR 440.17, shall be used to determine the compliance of flares with the visible emission provisions of this section. The observation period is 2 hours and shall be used according to Method 22 ~~of Appendix A, 40 CFR part 60, incorporated by reference in s. NR 440.17~~.

(c) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \sum_{i=1}^{n} C_i H_i$$

where:

H_T ~~—Net~~ is the net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25°C and 700 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C;

K ~~— Constant~~ is the conversion constant, $1.740 \times 10^{-7} \left[\frac{1}{\text{ppm}}\right]\left[\frac{\text{g-mole}}{\text{scm}}\right]\left[\frac{\text{MJ}}{\text{kcal}}\right]$

where the standard temperature for (g-mole)/scm is 20°C;

C_i ~~— Concentration~~ is the concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, and measured for hydrogen and carbon monoxide by ASTM D1946-77, incorporated by reference in s. NR 440.17; and

H_i ~~—Net~~ is the net heat of combustion of sample component i, kcal/(g-mole) at 25°C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76, incorporated by reference in s. NR 440.17, if published values are not available or cannot be calculated.

(e) The maximum permitted velocity, V_{max}, for flares complying with sub. (3)(d)3 shall be determined by the following equation:

$$\text{Log}_{10}\,(V_{max}) = (H_T + 28.8)/31.7$$

where:

V_{max} ~~—Maximum~~ is the maximum permitted velocity, m/sec

28.8 = ~~Constant~~ constant

31.7 = ~~Constant~~ constant

H_T ~~—The~~ is the net heating value as determined in par. (c)~~.~~

(f) The maximum permitted velocity, V_{max}, for air-assisted flares shall be determined by the following equation~~.~~:

$$V_{max} = 8.706 + 0.7084(H_T)$$

where:

V_{max} ~~— Maximum~~ is the maximum permitted velocity, m/sec

8.706 — ~~Constant~~ constant

0.7084 — ~~Constant~~ constant

H_T ~~— The~~ is the net heating value, as determined in par. (c)~~.~~

SECTION 27. NR 440.19(6)(c)1. is repealed and recreated to read:

NR 440.19(6)(c)1. Methods 6, 7 and 3B of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, as applicable, shall be used for the performance evaluations of sulfur dioxide and nitrogen oxides continuous monitoring systems. Acceptable alternative methods for Methods 6, 7 and 3B are given in sub. (7)(d).

SECTION 28. NR 440.19(6)(c)3. and (f)1. to 3., 4.a. and 5.(intro.) are amended to read:

NR 440.19(6)(c)3. For affected facilities burning fossil fuel, the span value for a continuous monitoring system measuring the opacity of emissions shall be 80, 90 or 100% and for a continuous monitoring system measuring sulfur oxides or nitrogen oxides the span value shall be determined as follows:

(In parts per million)

Fossil fuel	Span value for sulfur dioxide	Span value for nitrogen oxides
Gas	not applicable	500
Liquid	1,000	500
Solid	1,500	~~500~~ 1000
Combinations . .	1,000y + 1,500z	500(x+y) + 1,000z

in which:

x is the fraction of total heat input derived from gaseous fossil fuel

y is the fraction of total heat input derived from liquid fossil fuel

z is the fraction of total heat input derived from solid fossil fuel

~~Note: For solid fuel the span value for nitrogen oxides should be 1,000. The table will be corrected when this error has been corrected in the code of federal regulations.~~

(f)1. E = is the pollutant emissions, ng/J (lb/million Btu).

2. C = is the pollutant concentration, ng/dscm (lb/dscf), determined by multiplying the average concentration (ppm) for each one-hour period by 4.15×10^4 M ng/dscm per ppm (2.59×10^{-9} M lb/dscf per ppm) where M = pollutant molecular weight, g/g-mole (lb/lb-mole). M = 64.07 for sulfur dioxide and 46.01 for nitrogen oxides.

3. $\%O_2$~~T~~ or $\%CO_2$ = is the oxygen or carbon dioxide volume ~~(~~expressed as percent~~)~~, determined with equipment specified under par. ~~(d)~~ (a).

4.a. For anthracite coal as classified according to ASTM D388-77, incorporated by reference in s. NR 440.17, F = 2.723 × ~~10^{-17}~~ 10^{-7} dscm/J (10,140 dscf/million Btu) and F_c = 0.532 × ~~10^{-17}~~ 10^{-7} scm CO_2/J (1,980 scf CO_2/million Btu).

5.(intro.) The owner or operator may use the following equation to determine an F factor (dscm/J or dscf/million Btu) on a dry basis (if it is desired to calculate F on a wet basis, consult the department) or F_c factor (scm CO_2/J, or scf CO_2/million Btu) on either basis in lieu of the F or F_c factors specified in subd. 4:

$$F = \frac{10^{-6}\,[227.2(\%H)+95.5(\%C)+35.6(\%S)+8.7(\%N)-28.7(\%O)]}{GCV}$$

(SI units)

$$F_c = \frac{2.0 \times 10^{-5}\,(\%C)}{GCV}$$

(SI units)

$$F = \frac{10^{6}\,[3.64(\%H)+1.53(\%C)+0.57(\%S)+0.14(\%N)-0.46(\%O)]}{GCV}$$

(English Units)

~~$F_c = \frac{20.0(\%C)}{GCV}$~~

~~(SI units)~~

$$F_c = \frac{321 \times 10^{3}\,(\%C)}{GCV}$$

(English units)

SECTION 29. NR 440.19(6)(g)(intro.) is repealed and recreated to read:

NR 440.19(6)(g)(intro.) Excess emission and monitoring system performance reports shall be submitted to the department for every calendar quarter. All quarterly reports shall be postmarked by the 30th day following the end of each calendar quarter. Each excess emission and MSP report shall include the information required in s. NR 440.07(3). Periods of excess emissions and monitoring systems (MS) downtime that shall be reported are defined as follows:

SECTION 30. NR 440.19(7) is repealed and recreated to read:

NR 440.19(7) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2). Acceptable alternative methods and procedures are given in par. (d).

(b) The owner or operator shall determine compliance with the particulate matter, SO_2 and NO_x standards in subs. (3), (4) and (5) as follows:

1. The emission rate (E) of particulate matter, SO_2 or NO_x shall be computed for each run using the following equation:

$$E = CF_d\ (20.9)/(20.9 - \%\ O_2)$$

where:

E is the emission rate of pollutant, ng/J (lb/million Btu)

C is the concentration of pollutant, ng/dscm (lb/dscf)

$\%O_2$ is the oxygen concentration, percent dry basis

F_d is the factor as determined from Method 19

2. Method 5 shall be used to determine the particular matter concentration (C) at affected facilities without wet flue-gas-desulfurization (FGD) systems and Method 5B shall be used to determine the particulate matter concentration (C) after FGD systems.

a. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). The probe and filter holder heating systems in the sampling train may be set to provide a gas temperature no greater than 160±14°C (320±25°F).

b. The emission rate correction factor, integrated or grab sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration (% O_2). The O_2 sample shall be obtained simultaneously with, and at the same traverse points as, the particulate sample. If the grab sampling procedure is used, the O_2 concentration for the run shall be the arithmetic mean of all the individual O_2 sample concentrations at each traverse point.

c. If the particulate run has more than 12 traverse points, the O_2 traverse points may be reduced to 12 provided that Method 1 is used to locate the 12 O_2 traverse points.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

4. Method 6 shall be used to determine the SO_2 concentration.

a. The sampling site shall be the same as that selected for the particulate sample. The sampling location in the duct shall be at the centroid of the cross section or at a point no closer to the walls than 1 m (3.28 ft). The sampling time and sample volume for each sample run shall be at least 20 minutes and 0.020 dscm (0.71 dscf). Two samples shall be taken during a 1-hour period, with each sample taken within a 30-minute interval.

b. The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration (% O_2). The O_2 sample shall be taken simultaneously with, and at the same point as, the SO_2 sample. The SO_2 emission rate shall be computed for each pair of SO_2 and O_2 samples. The SO_2 emission rate (E) for each run shall be the arithmetic mean of the results of the 2 pairs of samples.

5. Method 7 shall be used to determine NO_x concentration.

a. The sampling site and location shall be the same as for the SO_2 sample. Each run shall consist of 4 grab samples, with each sample taken at about 15-minute intervals.

b. For each NO_x sample, the emission rate correction factor, grab sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration (%O_2). The sample shall be taken simultaneously with, and at the same point as, the NO_x sample.

c. The NO_x emission rate shall be computed for each pair of NO_x and O_2 samples. The NO_x emission rate (E) for each run shall be the arithmetic mean of the results of the 4 pairs of samples.

(c) When combinations of fossil fuels or fossil fuel and wood residue are fired, the owner or operator, in order to compute the prorated standard as shown in subs. (4)(b) and (5)(b), shall determine the percentage (w,x,y, or z) of the total heat input derived from each type of fuel as follows:

1. The heat input rate of each fuel shall be determined by multiplying the gross calorific value of each fuel fired by the rate of each fuel burned.

2. ASTM Methods D2015-77 (solid fuels), D240-76 (liquid fuels) or D1826-77 (gaseous fuels), incorporated by reference in s. NR 440.17, shall be used to determine the gross calorific values of the fuels. The method used to determine the calorific value of wood residue shall be approved by the department.

3. Suitable methods shall be used to determine the rate of each fuel burned during each test period, and a material balance over the steam generating system shall be used to confirm the rate.

(d) The owner or operator may use the following as alternatives to the reference methods and procedures in this subsection or in other subsections as specified:

1. The emission rate (E) of particulate matter, SO_2 and NO_x may be determined by using the F_c factor, provided that the following procedure is used:

a. The emission rate (E) shall be computed using the following equation:

$$E = CF_c\ (100/\%\ CO_2)$$

where:

E is the emission rate of pollutant, ng/J (lb/million Btu)

C is the concentration of pollutant, ng/dscm (lb/dscf)

$\%\ CO_2$ is the carbon dioxide concentration, percent dry basis

F_c is the factor as determined in appropriate sections of Method 19

b. If and only if the average F_c factor in Method 19 is used to calculate E and either E is from 0.97 to 1.00 of the emission standard or the relative accuracy of a continuous emission monitoring system is from 17 to 20%, then 3 runs of Method 3 shall be used to determine the O_2 and CO_2 concentration according to the procedures in sub. (7)(b)2 b, 4 b or 5 b. Then if F_o (average of 3 runs), as calculated from the equation in Method 3B, is more than ±3% than the average F_o value, as determined from the average values of F_d and F_c in Method 19, that is, $F_{oa} = 0.209 (F_{da}/F_{ca})$, then the following procedure shall be followed:

1) When F_o is less than 0.97 F_{oa}, then E shall be increased by that proportion under 0.97 F_{oa}, for example, if F_o is 0.95 F_{oa}, E shall be increased by 2%. This recalculated value shall be used to determine compliance with the emission standard.

2) When F_o is less than 0.97 F_{oa} and when the average difference (d) between the continuous monitor minus the reference methods is negative, then E shall be increased by that proportion under 0.97 F_{oa}, for example, if F_{oa} is 0.95 F_{oa}, E shall be increased by 2%. This recalculated value shall be used to determine compliance with the relative accuracy specification.

3) When F_o is greater than 1.03 F_{oa} and when the average difference d is positive, then E shall be decreased by that proportion over 1.03 F_{oa}, for example, if F_o is 1.05 F_{oa}, E shall be decreased by 2%. This recalculated value shall be used to determine compliance with the relative accuracy specification.

2. For Method 5 or 5B, Method 17 may be used at facilities with or without wet FGD systems if the stack gas temperature at the sampling location does not exceed an average temperature of 160°C (320°F). The procedures of sections 2.1 and 2.3 of Method 5B may be used with Method 17 only if it is used after wet FGD systems. Method 17 may not be used after wet FGD systems if the effluent gas is saturated or laden with water droplets.

3. Particulate matter and SO_2 may be determined simultaneously with the Method 5 train provided that the following changes are made:

a. The filter and impinger apparatus in sections 2.1.5 and 2.1.6 of Method 8 is used in place of the condenser (section 2.1.7) of Method 5.

b. All applicable procedures in Method 8 for the determination of SO_2, including moisture, are used.

4. For Method 6, Method 6C may be used. Method 6A may also be used whenever Methods 6 and 3B data are specified to determine the SO_2 emission rate, under the conditions in par. (d)1.

5. For Method 7, Method 7A, 7C, 7D or 7E may be used. If Method 7C, 7D or 7E is used, the sampling time for each run shall be at least 1 hour and the integrated sampling approach shall be used to determine the O_2 concentration (% O_2) for the emission rate correction factor.

6. For Method 3, Method 3A or 3B may be used.

7. For Method 3B, Method 3A may be used.

SECTION 31. NR 440.20(4)(h)1. and 2. are amended to read:

NR 440.20(4)(h)1. If emissions of sulfur dioxide to the atmosphere are greater than 260 ng/J (0.60 lb/million Btu) heat input:

~~E_{SO_2}~~ $\underline{E_S}$ = [340x + 520y]/100

and

~~P_{SO_2}~~ $\underline{\%P_S}$ = 10%

2. If emissions of sulfur dioxide to the atmosphere are equal to or less than 260 ng/J (0.60 lb/million Btu) heat input:

~~E_{SO_2}~~ $\underline{E_S}$ = [340x + 520y]/100

and

~~P_{SO_2}~~ $\underline{\%P_S}$ = [~~90~~ $\underline{10}$x + ~~70~~ $\underline{30}$y]/100

where:

~~E_{SO_2}~~ $\underline{E_S}$ is the prorated sulfur dioxide emission limit (ng/J heat input)

~~P_{SO_2}~~ $\underline{\%P_S}$ is the percentage of potential sulfur dioxide emission allowed ~~(percent reduction required = 100 - P_{SO_2})~~

x is the percentage of total heat input derived from the combustion of liquid or gaseous fuels, excluding solid-derived fuels

y is the percentage of total heat input derived from the combustion of solid fuel, including solid-derived fuels

SECTION 32. NR 440.20(5)(a)1. is amended to read:

NR 440.20(5)(a)1. NO_x emission limits.

Fuel Type	Emission limit for heat input	
	ng/J	(lb/million Btu)
Gaseous fuels:		
Coal-derived fuels	210	0.50
All other fuels	86	0.20
Liquid fuels:		
Coal-derived fuels	210	0.50
Shale oil	210	0.50
All other fuels	130	0.30
Solid fuels:		
Coal-derived fuels	210	0.50
Any fuel containing more than 25%, by weight, coal refuse	(¹)	(¹)
Any fuel containing more than 25%, by weight, lignite if the lignite is mined in North Dakota, South Dakota, or Montana, and is combusted in a slag tap furnace[2]	340	0.80
~~Lignite~~ Any fuel containing more than 25%, by weight, lignite not subject to the 340 ng/J heat input emission limit[2]	260	0.60
Subbituminous coal	210	0.50
Bituminous coal	260	0.60
Anthracite coal	260	0.60
All other fuels	260	0.60

[1] Exempt from NO_x standards and NO_x monitoring requirements.

[2] Any fuel containing less than 25%, by weight, lignite is not prorated but its percentage is added to the percentage of the predominant fuel.

SECTION 33. NR 440.20(5)(c) is amended to read:

NR 440.20(5)(c) When 2 or more fuels are combusted simultaneously, the applicable standard is determined by proration using the following formula:

$$\cancel{E_{NO_x}}\ E_n = [86\ w + 130\ x + 210\ y + 260\ z + 340\ v]/100$$

~~in which~~ where:

$\cancel{E_{NO_x}}$ E_n is the applicable standard for nitrogen oxides when multiple fuels are combusted simultaneously (ng/J heat input)

w is the percentage of total heat input derived from the combustion of fuels subject to the 86 ng/J heat input standard

x is the percentage of total heat input derived from the combustion of fuels subject to the 130 ng/J heat input standard

y is the percentage of total heat input derived from the combustion of fuels subject to the 210 ng/J heat input standard

z is the percentage of total heat input derived from the combustion of fuels subject to the 260 ng/J heat input standard

v is the percentage of total heat input delivered from the combustion of fuels subject to the 340 ng/J heat input standard

SECTION 34. NR 440.20(6)(d)3.(intro.) and (h) are amended to read:

NR 440.20(6)(d)3.(intro.) Designing, constructing and operating a spare flue gas desulfurization system module for an affected facility larger than 365 MW (1,250 million Btu/hr) heat input (approximately 125 MW electrical output capacity). The department may at its discretion require the owner or operator within 60 days of notification to demonstrate spare module capability. To demonstrate this capability, the owner or operator shall demonstrate compliance with the appropriate requirements under sub. (4)(a), (b), (d) and (~~i~~ h) for any period of operation lasting from 24 hours to 30 days when:

(h) If an owner or operator has not obtained the minimum quantity of emission data as required under sub. (7), compliance of the affected facility with the emission requirements under subs. (4) and (5) for the day on which the 30-day period ends may be determined by the department by following the applicable procedures in ~~sections 6.0 and~~ section 7.0 of ~~Reference~~ Method 19, 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17.

SECTION 35. NR 440.20(7)(f), (h) and (i)(intro.), 1. and 2. are repealed and recreated to read:

NR 440.20(7)(f) The owner or operator shall obtain emission data for at least 18 hours in at least 22 out of 30 successive boiler operating days. If this minimum data requirement cannot be met with a continuous monitoring system, the owner or operator shall supplement emission data with other monitoring systems approved by the department or the reference methods and procedures as described in par. (h).

(h) When it becomes necessary to supplement continuous monitoring system data to meet the minimum data requirements in par. (f), the owner or operator shall use the reference methods and procedures as specified in this paragraph. Acceptable alternative methods and procedures are given in par. (j).

1. Method 6 shall be used to determine the SO_2 concentration at the same location as the SO_2 monitor. Samples shall be taken at 60 minute intervals. The sampling time and sample volume for each sample shall be at least 20 minutes and 0.020 dscm (0.71 dscf). Each sample represents a 1-hour average.

2. Method 7 shall be used to determine the NO_x concentration at the same location as the concentration at the same location as the NO_x monitor.

Samples shall be taken at 30-minute intervals. The arithmetic average of two consecutive samples represent a 1-hour average.

3. The emission rate correction factor, integrated bag sampling and analysis procedure of Method 3B shall be used to determine the O_2 or CO_2 concentration at the same location as the O_2 or CO_2 monitor. Samples shall be taken for at least 30 minutes in each hour. Each sample represents a 1-hour average.

4. The procedures in Method 19 shall be used to compute each 1-hour average concentration in ng/J (lb/million Btu) heat input.

(i)(intro.) The owner or operator shall use methods and procedures in this paragraph to conduct monitoring system performance evaluations under s. NR 440.13(3) and calibration checks under s. NR 440.13(4). Acceptable alternative methods and procedures are given in par. (j).

1. Methods 6, 7 and 3B, as applicable, shall be used to determine O_2, SO_2 and NO_x concentrations.

2. SO_2 or NO_x (NO), as applicable, shall be used for preparing the calibration gas mixtures (in N_2, as applicable) under Performance Specification 2 of Appendix B of 40 CFR part 60, incorporated by reference in s. NR 440.17.

SECTION 36. NR 440.20(7)(j) is created to read:

NR 440.20(7)(j) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this subsection. All test methods are in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17.

1. For Method 6, Method 6A or 6B (whenever Methods 6 and 3 or 3B data are used) or 6C may be used. Each Method 6B sample obtained over 24 hours represents 24 1-hour averages. If Method 6A or 6B is used under par. (i), the conditions under s. NR 440.19(7)(d)1 apply; these conditions do not apply under par. (h).

2. For Method 7, Method 7A, 7C, 7D or 7E may be used. If Method 7C, 7D or 7E is used, the sampling time for each run shall be 1 hour.

3. For Method 3, Method 3A may be used if the sampling time is 1 hour.

4. For Method 3B, Method 3A may be used.

SECTION 37. NR 440.20(8) is repealed and recreated to read:

NR 440.20(8) COMPLIANCE DETERMINATION TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or the methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2). Section NR 440.08(6) does not apply to this subsection for SO_2 and NO_x. Acceptable alternative methods are given in par. (e).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. The dry basis F factor (O_2) procedures in Method 19 shall be used to compute the emission rate of particulate matter.

2. For the particular matter concentration, Method 5 shall be used at affected facilities without wet FGD systems and Method 5B shall be used after wet FGD systems.

a. The sampling time and sample volume for each run shall be at least 120 minutes and 1.70 dscm (60 dscf). The probe and filter holder heating system in the sampling train may be set to provide an average gas temperature of no greater than 160±14°C (320±25°F).

b. For each particulate run, the emission rate correction factor, integrated or grab sampling and analysis procedures of Method 3B shall be used to determine the O_2 concentration. The O_2 sample shall be obtained simultaneously with, and at the same traverse points as, the particulate run. If the particulate run has more than 12 traverse points, the O_2 simultaneous traverse points may be reduced to 12 provided that Method 1 is used to locate the 12 O_2 traverse points. If the grab sampling procedure is used, the O_2 concentration for the run shall be the arithmetic mean of all the individual O_2 concentrations at each traverse point.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(c) The owner or operator shall determine compliance with the SO_2 standards in sub. (4) as follows:

1. The percent of potential SO_2 emissions ($\% P_s$) to the atmosphere shall be computed using the following equation:

$$\% P_s = [(100 - \%R_f)(100 - \%R_g)]/100$$

where:

$\%P_s$ is the percent of potential SO_2 emissions, percent

$\%R_f$ is the percent reduction from fuel pretreatment, percent

$\%R_g$ is the percent reduction by SO_2 control system, percent

2. The procedures in Method 19 may be used to determine percent reduction ($\%R_f$) of sulfur by such processes as fuel pretreatment (physical coal cleaning, hydrodesulfurization of fuel oil, etc.), coal pulverizers, and bottom and flyash interactions. This determination is optional.

3. The procedures in Method 19 shall be used to determine the percent SO_2 reduction ($\%R_g$ of any SO_2 control system. Alternatively, a combination of an "as fired" fuel monitor and emission rates measured after the control system, following the procedures in Method 19, may be used if the percent reduction is calculated using the average emission rate from the SO_2 control device and the average SO_2 input rate from the "as fired" fuel analysis for 30 successive boiler operating days.

4. The appropriate procedures in Method 19 shall be used to determine the emission rate.

5. The continuous monitoring system in sub. (7)(b) and (d) shall be used to determine the concentrations of SO_2 and CO_2 or O_2.

(d) The owner or operator shall determine compliance with the NO_x standard in sub. (5) as follows:

1. The appropriate procedures in Method 19 shall be used to determine the emission rate of NO_x.

2. The continuous monitoring system in sub. (7)(c) and (d) shall be used to determine the concentrations of NO_x and CO_2 or O_2.

(e) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this subsection:

1. For Method 5 or 5B, Method 17 may be used at facilities with or without wet FGD systems if the stack temperature at the sampling location does not exceed an average temperature of 160°C (320°F). The procedures of sections 2.1 and 2.3 of Method 5B may be used in Method 17 only if it is used

after wet FGD systems. Method 17 may not be used after wet FGD systems if the effluent is saturated or laden with water droplets.

2. The F_c factor (CO_2) procedures in Method 19 may be used to compute the emission rate of particulate matter under the stipulations of s. NR 440.19(7)(d)1. The CO_2 shall be determined in the same manner as the O_2 concentration.

SECTION 38. NR 440.205(1)(c) is amended to read:

NR 440.205(1)(c) Affected facilities which also meet the applicability requirements under s. NR 440.26 (standards of performance for petroleum refineries) are subject to the particulate matter and nitrogen oxides standards ~~in~~ under this section and the sulfur dioxide standards under s. NR 440.26(5).

SECTION 39. NR 440.205(2)(c), (k), (l) and (zb) are amended to read:

NR 440.205(2)(c) "Chemical manufacturing plants" means industrial plants which are classified by the department of commerce under ~~standard industrial classifications (~~SIC~~)~~ code 28 in the Standard Industrial Classification Manual, incorporated by reference in s. NR 440.17.

(k) "Emerging technology" means any sulfur dioxide control system that is not defined as a conventional technology under this ~~section~~ subsection, and for which the owner or operator of the facility has applied to the administrator and received approval to operate as an emerging technology under sub. (10)(a)4.

(l) "Federally enforceable" means all limitations and conditions that are enforceable by the administrator including the requirements of 40 CFR ~~pts.~~ parts 60 and 61, requirements within any applicable state implementation plan, and any permit requirements established under 40 CFR s. 52.21 or under 40 CFR ~~s.~~ ss. 51.18 and ~~40 CFR s.~~ 51.24, incorporated by reference in s. NR 440.17.

(zb) "Petroleum refinery" means industrial plants as classified by the department of commerce under ~~standard industrial classification (~~SIC~~)~~ code 29 in the Standard Industrial Classification Manual, incorporated by reference in s. NR 440.17.

SECTION 40. NR 440.205(2)(zj) is repealed and recreated to read:

NR 440.205(2)(zj) "Very low sulfur oil" means an oil that contains no more than 0.5 weight percent sulfur or that, when combusted without sulfur dioxide emission control, has a sulfur dioxide emission rate equal to or less than 215 ng/J (0.5 lb/million Btu) heat input.

SECTION 41. NR 440.205(3)(a), (c), (d), (e), (f)(intro.) and 2. and (g) are amended to read:

NR 440.205(3)(a) Except as provided in par. (b), (c), ~~or~~ (d), or (j) on and after the date on which the performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that combusts coal or oil may cause to be discharged into the atmosphere any gases that contain sulfur dioxide in excess of 10% (0.10) of the potential sulfur dioxide emission rate (90% reduction) and that contain sulfur dioxide in excess of the emission limit determined according to the following formula:

$$E_s = (K_a H_a + K_b H_b)/(H_a + H_b)$$

where:

E_s is the sulfur dioxide emission limit, in ng/J or lb/million Btu heat input

K_a is 520 ng/J (or 1.2 lb/million Btu)

K_b is 340 ng/J (or 0.80 lb/million Btu)

H_a is the heat input from the combustion of coal, in J (million Btu)

H_b is the heat input from the combustion of oil, in J (million Btu)

Only the heat input supplied to the affected facility from the combustion of coal and oil is counted under this ~~section~~ subsection. No credit is provided for the heat input to the affected facility from the combustion of natural gas, wood, municipal-type solid waste, or other fuels or heat input to the affected facility from exhaust gases from another source, such as gas turbines, internal combustion engines, kilns, etc.

(c) On and after the date on which the performance test is completed or is required to be completed under s. NR 440.08, whichever comes first, no owner or operator of an affected facility that combusts coal or oil, either alone or in combination with any other fuel, and that uses an emerging technology for the control of sulfur dioxide emissions, may cause to be discharged into the atmosphere any gases that contain sulfur dioxide in excess of 50% of the potential sulfur dioxide emission rate (50% reduction) and that contain sulfur dioxide in excess of the emission limit determined according to the following formula:

$$E_s = (K_c H_c + K_d H_d)/(H_c + H_d)$$

where:

E_s is the sulfur dioxide emission limit, expressed in ng/J or lb/million Btu heat input

K_c is 260 ng/J (or 0.60 lb/million Btu)

K_d is 170 ng/J (or 0.40 lb/million Btu)

H_c is the heat input from the combustion of coal, in J (million Btu)

H_d is the heat input from the combustion of oil, in J (million Btu)

Only the heat input supplied to the affected facility from the combustion of coal and oil is counted under this ~~section~~ subsection. No credit is provided for the heat input to the affected facility from the combustion of natural gas, wood, municipal-type solid waste, or other fuels, or from the heat input to the affected facility from exhaust gases from another source, such as gas turbines, internal combustion engines, kilns, etc.

(d) On and after the date on which the performance test is completed or required to be completed under s. NR 440.08, whichever comes first, no owner or operator of an affected facility listed in subd. 1, 2, or 3~~, or 4~~, may cause to be discharged into the atmosphere any gases that contain sulfur dioxide in excess of 520 ng/J (1.2 lb/million Btu) heat input if the affected facility combusts coal, or ~~130 ng/J (0.30 lb/million Btu)~~ 215 ng/J (0.5 lb/million Btu) heat input if the affected facility combusts oil other than very low sulfur oil. Percent reduction requirements are not applicable to affected facilities under this paragraph.

1. Affected facilities that have an annual capacity factor for coal and oil of 30% (0.30) or less and are subject to a federally enforceable permit

limiting the operation of the affected facility to an annual capacity factor for coal and oil to 30% (0.30) or less;

2. Affected facilities located in a noncontinental area; or

3. Affected facilities combusting coal or oil, alone or in combination with any other fuel, in a duct burner as part of a combined cycle system where 30% (0.30) or less of the heat input to the steam generating unit is from combustion of coal and oil in the duct burner and 70% (0.70) or more of the heat input to the steam generating unit is from the exhaust gases entering the duct burner~~; or~~

~~4. Affected facilities combusting very low sulfur oil~~.

(e) Except as provided in par. (f), compliance with the emission limits, fuel oil sulfur limits, and/or percent reduction requirements under this ~~section~~ subsection are determined on a 30-day rolling average basis.

(f)(intro.) ~~Compliance~~ Except as provided for in par. (j)2. compliance with the emission limits or fuel oil sulfur limits under this ~~section are~~ subsection is determined on a 24-hour average basis for affected facilities ~~which~~ that:

2. Combust only very low sulfur oil ~~which emits less than 130 ng/J (0.3 SO_2/million Btu)~~; and

(g) Except as provided in par. (i), the sulfur dioxide emission limits and percent reduction requirements under this ~~section~~ subsection apply at all times, including periods of startup, shutdown, and malfunction.

SECTION 42. NR 440.205(3)(j) is created to read:

NR 440.205(3)(j) Percent reduction requirements are not applicable to affected facilities combusting only very low sulfur oil. The owner or operator of an affected facility combusting very low sulfur oil shall demonstrate that the oil meets the definition of very low sulfur oil by:

1. Following the performance testing procedures as described in sub. (6)(c) or (d), and following the monitoring procedures as described in sub. (8)(a) or (b) to determine sulfur dioxide emission rate or fuel oil sulfur content; or

2. Maintaining fuel receipts as described in sub. (10)(r).

SECTION 43. NR 440.205(4)(a)1.(intro.), (b), (e) and (f) are amended to read:

NR 440.205(4)(a)1.(intro.) 22 ng/J (~~0.05~~ 0.050 lb/million Btu) heat input:

(b) On or after the date on which the performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that combusts oil ~~or that combusts mixtures of oil with other fuels may~~, or mixtures of oil with other fuels, and uses a conventional or emerging technology to reduce sulfur dioxide emissions shall discharge into the atmosphere from that affected facility any gases that contain particulate matter in excess of 43 ng/J (0.10 lb/million Btu) heat input.

(e) For the purposes of this ~~section~~ subsection, the annual capacity factor is determined by dividing the actual heat input to the steam generating unit during the calendar year from the combustion of coal, wood, or municipal-type solid waste, and other fuels, as applicable, by the potential heat input to the steam generating unit if the steam generating unit had been operated for 8,760 hours at the maximum design heat input capacity.

(f) On and after the date on which the initial performance test is completed or is required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility ~~subject to the particulate matter emission limits under par. (a), (b) or (c) may~~ that combusts coal, oil, wood or mixtures of these fuels with any other fuels shall cause to be discharged into the atmosphere any gases that exhibit greater than 20% opacity (6-minute average), except for one 6-minute period per hour of not more than 27% opacity.

SECTION 44. NR 440.205(5)(a), (b), (f)1.(intro.), (g) and (h) are amended to read:

NR 440.205(5)(a) ~~On~~ Except as provided under par. (k), on and after the date on which the performance test is completed or is required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that is subject to the provisions of this ~~section~~ subsection and that combusts only coal, oil, or natural gas may cause to be discharged into the atmosphere from that affected facility any gases that contain nitrogen oxides (expressed as NO_2) in excess of the following emission limits:

Fuel/Steam generating unit type	Nitrogen oxide emission limits ng/J (lb/million Btu) (expressed as NO_2) heat input
1. Natural gas and distillate oil, except 4.:	
a. Low heat release rate	43 (0.10)
b. High heat release rate	86 (0.20)
2. Residual oil:	
a. Low heat release rate	130 (0.30)
b. High heat release rate	170 (0.40)
3. Coal:	
a. Mass-feed stoker	210 (0.50)
b. Spreader stoker and fluidized bed combustion	260 (0.60)
c. Pulverized coal	300 (0.70)
d. Lignite, except e.	260 (0.60)
e. Lignite mined in North Dakota, South Dakota, or Montana and combusted in a slag tap furnace	340 (0.80)
f. Coal-derived synthetic fuels	210 (0.50)
4. Duct burner used in a combined cycle system:	
a. Natural gas and distillate oil	86 (0.20)
b. Residual oil	170 (0.40)

(b) ~~On~~ Except as provided under par. (k), on and after the date on which the initial performance test is required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that simultaneously combusts mixtures of coal, oil, or natural gas may cause to be discharged into the atmosphere from that affected facility any gases that contain nitrogen oxides in excess of a limit determined by use of the following formula:

$$E_n = [(EL_{go} \times H_{go}) + (EL_{ro} \times H_{ro}) + (EL_c \times H_c)]/(H_{go} + H_{ro} + H_c)$$

where:

E_n is the nitrogen oxides emission limit (expressed as NO_2), ng/J (lb/million Btu)

EL_{go} is the appropriate emission limit from par. (a)1 for combustion of natural gas or distillate oil, ng/J (lb/million Btu)

H_{go} is the heat input from combustion of natural gas or distillate oil, J (million Btu)

EL_{ro} is the appropriate emission limit from par. (a)2 for combustion of residual oil

H_{ro} is the heat input from combustion of residual oil, J (million Btu)

EL_c is the appropriate emission limit from par. (a)3 for combustion of coal

H_c is the heat input from combustion of coal, J (million Btu)

(f)1.(intro.) Any owner or operator of an affected facility petitioning for a facility-specific nitrogen oxides emission limit under this ~~section~~ subsection shall:

(g) Any owner or operator of an affected facility that combusts hazardous waste, as defined by 40 CFR part 261 or 40 CFR part 761, incorporated by reference in s. NR 440.17, with natural gas or oil may petition the administrator within 180 days of the initial startup of the affected facility for a waiver from compliance with the nitrogen oxides emission limit which applies specifically to that affected facility. The petition shall include sufficient and appropriate data, as determined by the administrator, on nitrogen oxides emissions from the affected facility, waste destruction efficiencies, waste composition (including nitrogen content), the quantity of specific wastes to be combusted and combustion conditions, to allow the administrator to determine if the affected facility is able to comply with the nitrogen oxides emission limits required by this ~~section~~ subsection. The owner or operator of the affected facility shall demonstrate that when hazardous waste is combusted in the affected facility, thermal destruction efficiency requirements for hazardous waste specified in an applicable federally enforceable requirement preclude compliance with the nitrogen oxides emission limits of this ~~section~~ subsection. The nitrogen oxides emission limits for natural gas or distillate oil in par. (a)1 or for residual oil in par. (a)2, as appropriate, are applicable to the affected facility until and unless the petition is approved by the administrator.

(h) ~~The~~ For purposes of par. (i), the nitrogen oxide standards under this ~~section~~ subsection apply at all times including periods of startup, shutdown, or malfunction.

SECTION 45. NR 440.205(5)(i), (j) and (k) are created to read:

NR 440.205(5)(i). Except as provided under par. (j), compliance with the emission limits under this subsection is determined on a 30-day rolling average basis.

(j) Compliance with the emission limits under this subsection is determined on a 24-hour average basis for the initial performance test and on a 3-hour average basis for subsequent performance tests for any affected facilities that:

1. Combust, alone or in combination, only natural gas, distillate oil or residual oil with a nitrogen content of 0.30 weight percent or less;

2. Have a combined annual capacity factor of 10% or less for natural gas, distillate oil and residual oil with a nitrogen content of 0.30 weight percent or less, and

3. Are subject to a federally enforceable requirement limiting operation of the affected facility to the firing of natural gas, distillate oil and/or residual oil with a nitrogen content of 0.30 weight percent or less and limiting operation of the affected facility to a combined annual capacity factor of 10% or less for natural gas, distillate oil and residual oil and a nitrogen content of 0.30 weight percent or less.

(k) Affected facilities that meet the criteria described in par. (j)1, 2, and 3, and that have a heat input capacity of 73 MW (250 million Btu/hour) or less, are not subject to the nitrogen oxides emission limits under this subsection.

SECTION 46. NR 440.205(6)(b), (c)2.a. and b., 3.a. and 5. and (d)(intro.) are amended to read:

NR 440.205(6)(b) In conducting the performance tests required under s. NR 440.08, the owner or operator shall use the <u>cited</u> methods and procedures in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or the methods and procedures as specified in this ~~section~~ <u>subsection</u>, except as provided in s. NR 440.08(2). Section NR 440.08(6) does not apply to this ~~section~~ <u>subsection</u>. The 30-day notice required in s. NR 440.08(4) applies only to the initial performance test unless otherwise specified by the department.

(c)2.a. The procedures in Method 19, Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, shall be used to determine the hourly sulfur dioxide emission rate (E_{ho}) and the 30-day average emission rate (E_{ao}). The hourly averages used to compute the 30-day averages are obtained from the continuous emission monitoring system of sub. (8)(a) or (b).

b. The percent of potential sulfur dioxide emission rate ($\%P_s$) emitted to the atmosphere is computed using the following formula:

$$\%P_s = 100(1 - \%R_g/100)(1 - \%R_f/100)$$

where:

$\%R_g$ is the sulfur dioxide removal efficiency of the control device as determined by Method 19~~, Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17~~

$\%R_f$ is the sulfur dioxide removal efficiency of fuel pretreatment as determined by Method 19~~, Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17~~

3.a. An adjusted hourly sulfur dioxide emission rate ($E_{ho}°$) is used in Equation 19-19 of Method 19~~, Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17,~~ to compute an adjusted 30-day average emission rate ($E_{ao}°$). The E_{ho} is computed using the following formula:

$$E_{ho}° = [E_{ho} - E_w(1 - X_k)]/X_k$$

where:

$E_{ho}°$ is the adjusted hourly sulfur dioxide emission rate, ng/J (lb/million Btu)

E_{ho} is the hourly sulfur dioxide emission rate, ng/J (lb/million Btu)

E_w is the sulfur dioxide concentration in fuels other than coal and oil combusted in the affected facility, as determined by the fuel sampling and analysis procedures in Method 19, ng/J (lb/million Btu). The value E_w for each fuel lot is used for each hourly average during the time that the lot is being combusted.

X_k is the fraction of total heat input from fuel combustion derived from coal, oil, or coal and oil, as determined by applicable procedures in Method 19

5. The owner or operator of an affected facility that qualifies under the provisions of sub. (3)(d)~~,~~ does not have to measure parameters E_w or X_k under subd. 3 if the owner or operator of the affected facility elects to measure sulfur dioxide emission rates of the coal or oil following the fuel sampling and analysis procedures under Method 19~~, Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17,~~.

(d)(intro.) ~~The owner or operator of an affected facility that combusts only oil emitting less than 130 ng/J (0.3 lb/million Btu) SO$_2$~~ Except as provided in par. (j), the owner or operator of an affected facility that combusts only very low sulfur oil, has an annual capacity factor for oil of 10% (0.10) or less, and is subject to a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor for oil of 10% (0.10) or less shall:

SECTION 47. NR 440.205(6)(j) is created to read:

NR 440.205(6)(j) The owner or operator of an affected facility that combusts very low sulfur oil is not subject to the compliance and performance testing requirements of this subsection if the owner or operator obtains fuel receipts as described in sub. (10)(r).

SECTION 48. NR 440.205(7)(c), (d)(intro.), 1. and 6.a. and c. and (f) are amended to read:

NR 440.205(7)(c) Compliance with the nitrogen oxides emission standards under sub. (5) shall be determined through performance testing ~~as described in~~ under par. (e) or (f), or under pars. (g) and (h), as applicable.

(d)(intro.) ~~The following procedures and reference methods are used to~~ To determine compliance with the standards for particulate matter ~~emissions~~ emission limits and opacity limits under sub. (4), the owner or operator of an affected facility shall conduct an initial performance test as required under s. NR 440.08 using the following procedures and reference methods. These reference methods and procedures are in 40 CFR part 60, Appendix A, which is incorporated by reference in s. NR 440.17.

1. Method ~~3~~ 3B is used for gas analysis when applying Method 5 or Method 17.

6.a. The oxygen or carbon dioxide measurements and particulate matter measurements obtained under this ~~section~~ subsection,

c. The dry basis emission rate calculation procedure contained in Method 19 ~~(Appendix A)~~.

(f) To determine compliance with the emission limit for nitrogen oxides required by sub. (5)(a)4 for duct burners used in combined cycle systems, the owner or operator of an affected facility shall conduct the performance test required under s. NR 440.08 using the nitrogen oxides and oxygen measurement procedures in Method 20 of Appendix A, 40 CFR part 60, ~~Appendix A, Method 20,~~ incorporated by reference in s. NR 440.17. During the performance test, one sampling site shall be located as close as practicable to the exhaust of the turbine, as provided by s. 6.1.1 of Method 20~~, Appendix A, 40 CFR part 60, incorporated by reference in s. NR 440.17~~. A second sampling site shall be located at the outlet to the steam generating unit. Measurements of nitrogen oxides and oxygen shall be taken at both sampling sites simultaneously during the performance test. The nitrogen oxides emission rate from the combined cycle system shall be calculated by subtracting the nitrogen oxides emission rate measured at the sampling site at the outlet from the turbine from the nitrogen oxides emission rate measured at the sampling site at the outlet from the steam generating unit.

SECTION 49. NR 440.205(7)(g) and (h) are created to read:

NR 440.205(7)(g) The owner or operator of an affected facility described in sub. (5)(j) or (k) shall demonstrate the maximum heat input capacity of the steam generating unit by operating the facility at maximum capacity for 24 hours. The owner or operator of an affected facility shall determine the maximum heat input capacity using the heat loss method described in Sections 5 and 7.3 of the ASME Power Test Codes 4.1, incorporated by reference in s. NR 440.17(h). This demonstration of maximum heat input capacity shall be made during the initial performance test for affected facilities that meet the criteria of sub. (5)(j). It shall be made within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of each facility, for affected facilities meeting the criteria of sub. (5)(k). Subsequent demonstrations may be required by the department at any other time. If this demonstration indicates that the maximum heat input capacity of the affected facility is less than that stated by the manufacturer of the affected facility, the maximum heat input capacity determined during this demonstration shall be used to determine the capacity utilization rate for the affected facility. Otherwise, the maximum heat input capacity provided by the manufacturer is used.

(h) The owner or operator of an affected facility described in sub. (5)(j) that has a heat input capacity greater than 73 MW (250 million Btu/hour) shall:

1. Conduct an initial performance test as required under s. NR 440.08 over a minimum of 24 consecutive steam generating unit operating hours at maximum heat input capacity to demonstrate compliance with the nitrogen oxides emission standards under sub. (5) using Method 7, 7A, 7E of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, or other approved reference methods; and

2. Conduct subsequent performance tests once per calendar year or every 400 hours or operation (whichever comes first) to demonstrate compliance with the nitrogen oxides emission standards under sub. (5) over a minimum of 3 consecutive steam generating unit operating hours at maximum heat input capacity using Method 7, 7A, 7E or other approved reference methods.

SECTION 50. NR 440.205(8)(a) and (b)2. are amended to read:

NR 440.205(8)(a) Except as provided in ~~par.~~ pars. (b)~~,~~ and (f), the owner or operator of an affected facility subject to the sulfur dioxide standards under sub. (3) shall install, calibrate, maintain, and operate continuous emission monitoring systems (CEMS) for measuring sulfur dioxide concentrations and either oxygen (O_2) or carbon dioxide (CO_2) concentrations and shall record the output of the systems. The sulfur dioxide and either oxygen or carbon dioxide concentrations shall both be monitored at the inlet and outlet of the sulfur dioxide control device.

(b)2. Measuring sulfur dioxide according to Method 6B of Appendix A, 40 CFR part 60, incorporated by reference in s. NR 440.17, at the inlet or outlet to the sulfur dioxide control system. An initial stratification test is required to verify the adequacy of the Method 6B sampling location. The stratification test shall consist of 3 paired runs of a suitable sulfur dioxide and carbon dioxide measurement train operated at the candidate location and a second similar train operated according to the procedures in Section 3.2 and the applicable procedures in Section 7 of Performance Specification 2 of Appendix B, 40 CFR part 60, incorporated by reference in s. NR 440.17. Method 6B, Method 6A, or a combination of Methods 6 and 3 or 3B or Methods 6C and 3A, all in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, are suitable measurement techniques. If Method 6B is used for the second train, sampling time and timer operation may be adjusted for the stratification test as long as an adequate sample volume is collected; however, both sampling trains are to be operated similarly. For the location to be adequate for Method 6B 24-hour tests, the mean of the absolute difference between the 3 paired runs shall be less than 10%.

SECTION 51. NR 440.205(8)(f) is created to read:

NR 440.205(8)(f) The owner or operator of an affected facility that combusts very low sulfur oil is not subject to the emission monitoring requirements of this subsection if the owner or operator obtains fuel receipts as described in sub. (10)(r).

SECTION 52. NR 440.205(9)(b) and (f) are amended to read:

NR 440.205(9)(b) Except as provided ~~in~~ under pars. (g), ~~and~~ (h) and (i), the owner or operator of an affected facility subject to the nitrogen oxides standard of sub. (5)~~(a)~~ shall install, calibrate, maintain, and operate a continuous monitoring system for measuring nitrogen oxides emissions discharged to the atmosphere and record the output of the system.

(f) When nitrogen oxides emission data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, emission data will be obtained by using standby monitoring systems, Method 7 or 7A of Appendix A, 40 CFR part 60, incorporated by reference in s. NR 440.17, or other approved reference methods to provide emission data for a minimum of 75% of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days.

SECTION 53. NR 440.205(9)(i) is created to read:

NR 440.205(9)(i) The owner or operator of an affected facility described under sub. (5)(j) or (k) is not required to install or operate a continuous monitoring system for measuring nitrogen oxide emissions.

SECTION 54. NR 440.205(10)(a)2., (b), (e), (g)(intro.), (m)2. to 4. and (o) are amended to read:

NR 440.205(10)(a)2. If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under subs. (3)(d)1, (4)(a)2, 3 c, (c)2 b, (d)2 c, (5)(c), (d), (e), ~~or~~ (i), (j) or (k), (6)(d), (7)(g) or (h), or (9)(i).

(b) The owner or operator of each affected facility subject to the sulfur dioxide, particulate matter, and/or nitrogen oxides emission limits under subs. (3), (4), and (5) shall submit to the department the performance test data from the initial performance test and the performance evaluation of the CEMS using the applicable performance specifications in Appendix B, 40 CFR incorporated by reference in s. NR 440.17. The owner or operator of each affected facility described in sub. (5)(j) or (k) shall submit to the department the maximum heat input capacity data from the demonstration of the maximum heat input capacity of the affected facility.

(e) ~~For affected facilities that:~~

~~1. Combust residual oil having a nitrogen content of 0.3 weight % or less;~~

~~2. Have heat input capacities of 73 MW (250 million Btu/hour) or less; and~~

~~3. Monitor nitrogen oxides emissions or steam generating unit operating conditions under sub. (9)(g),~~ For an affected facility that combusts residual oil and meets the criteria under sub. (5)(j) or (k) or (7)(e)4, the owner or operator shall maintain records of the nitrogen content of the residual oil combusted in the affected facility and calculate the average fuel nitrogen content on a per calendar quarter basis. The nitrogen content shall be determined using ASTM Method D3431-80 (reapproved 1987), Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons, incorporated by reference in s. NR 440.17, or fuel specification data obtained from fuel suppliers. If residual oil blends are being combusted, fuel nitrogen specifications may be prorated based on the ratio of residual oils of different nitrogen content in the fuel blend.

(g)(intro.) ~~For facilities~~ Except as provided under par. (p), the owner or operator of an affected facility subject to nitrogen oxides standards under sub. (5)~~, the owner or operator~~ shall maintain records of the following information for each steam generating unit operating day:

(m)2. The standard deviation of hourly averages for outlet emission rates and inlet emission rates, as determined in Method 19, Section 7 of Appendix A, 40 CFR part 60, incorporated by reference in s. NR 440.17.

3. The lower confidence limit for the mean outlet emission rate and the upper confidence limit for the mean inlet emission rate, as calculated in Method 19, Section 7~~, incorporated by reference in s. NR 440.17~~.

4. The ratio of the lower confidence limit for the mean outlet emission rate and the allowable emission rate, as determined in Method 19, Section 7~~, incorporated by reference in s. NR 440.17~~.

(o) All records required under this ~~section~~ subsection shall be maintained by the owner or operator of the affected facility for a period of 2 years following the date of the record.

SECTION 55. NR 440.205(10)(p) to (r) are created to read:

NR 440.205(10)(p) The owner or operator of an affected facility described in sub. (5)(j) or (k) shall maintain records of the following information for each steam generating unit operating day:

1. Calendar date,

2. The number of hours of operation, and

3. A record of the hourly steam load.

(q) The owner or operator of an affected facility described in sub. (5)(j) or (k) shall submit to the department on a quarterly basis:

1. The annual capacity factor over the previous 12 months,

2. The average fuel nitrogen content during the quarter, if residual oil was fired; and

3. If the affected facility meets the criteria described in sub. (5)(j), the results of any nitrogen oxides emission tests required during the quarter,

the hours of operation during the quarter and the hours of operation since the last nitrogen oxides emission test.

(r) The owner or operator of an affected facility who elects to demonstrate that the affected facility combusts only very low sulfur oil under sub. (3)(j)2 shall obtain and maintain at the affected facility fuel receipts from the fuel supplier which certify that the oil meets the definition of distillate oil as defined in sub. (2). For the purposes of this subsection, the oil need not meet the fuel nitrogen content specification in the definition of distillate oil. Quarterly reports shall be submitted to the department certifying that only very low sulfur oil meeting this definition was combusted in the affected facility during the preceding quarter.

SECTION 56. NR 440.207 is created to read:

<u>NR 440.207 SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS</u> (1) APPLICABILITY. (a) The affected facility to which this section applies is each steam generating unit for which construction, modification or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million Btu per hour (Btu/hr)) or less, but greater than or equal to 2.9 MW (10 million Btu/hr).

(2) DEFINITIONS. As used in this section, all terms not defined herein shall have the meaning given them in s. NR 440.02.

(a) "Annual capacity factor" means the ratio between the actual heat input to a steam generating unit from an individual fuel or combination of fuels during a period of 12 consecutive calendar months and the potential heat input to the steam generating unit from all fuels had the steam generating unit been operated for 8,760 hours during that 12-month period at the maximum design heat input capacity. In the case of steam generating units that are rented or leased, the actual heat input shall be determined based on the combined heat input from all operations of the affected facility during a period of 12 consecutive calendar months.

(b) "Coal" means all solid fuels classified as anthracite, bituminous, subbituminous or lignite by the American Society for Testing and Materials in ASTM D388-77, "Standard Specification for Classification of Coals by Rank", incorporated by reference in s. NR 440.17; coal refuse; and petroleum coke. Synthetic fuels derived from coal for the purpose of creating useful heat, including but not limited to solvent-refined coal, gasified coal and coal-oil mixtures, are included in this definition for the purposes of this section.

(c) "Coal refuse" means any by-product of coal mining or coal cleaning operations with an ash content greater than 50% (by weight) and a heating value less than 13,900 kilojoules per kilogram (k/kg) (6,000 Btu per pound (Btu/lb)) on a dry basis.

(d) "Cogeneration steam generating unit" means a steam generating unit that simultaneously produces both electrical (or mechanical) and thermal energy from the same primary energy source.

(e) "Combined cycle system" means a system in which a separate source, such as a stationary gas turbine, internal combustion engine or kiln, provides exhaust gas to a steam generating unit.

(f) "Conventional technology" means wet flue gas desulfurization technology, dry flue gas desulfurization technology, atmospheric fluidized bed combustion technology and oil hydrodesulfurization technology.

(g) "Distillate oil" means fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials in ASTM D396-78, "Standard Specification for Fuel Oils", incorporated by reference in s. NR 440.17.

(h) "Dry flue gas desulfurization technology" means a sulfur dioxide (SO_2) control system that is located between the steam generating unit and the exhaust vent or stack, and that removes sulfur oxides from the combustion gases of the steam generating unit by contacting the combustion gases with an alkaline slurry or solution and forming a dry powder material. This definition includes devices where the dry powder material is subsequently converted to another form. Alkaline reagents used in dry flue gas, desulfurization systems include, but are not limited to, lime and sodium compounds.

(i) "Duct burner" means a device that combusts fuel and that is placed in the exhaust duct from another source, such as a stationary gas turbine, internal combustion engine, kiln, and other similar devices, to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

(j) "Emerging technology" means any SO_2 control system that is not defined as a conventional technology under this subsection, and for which the owner or operator of the affected facility has received approval from the administrator to operate as an emerging technology under sub. (9)(a)4.

(k) "Federally enforceable" means all limitations and conditions that are enforceable by the administrator or the department, including the requirements of 40 CFR parts 60 and 61, requirements within any applicable state implementation plan and any permit requirements established under 40 CFR 52.21 or under 40 CFR 51.18 and 40 CFR 51.24, incorporated by reference in s. NR 440.17.

(l) "Fluidized bed combustion technology" means a device wherein fuel is distributed onto a bed, or series of beds, of limestone aggregate, or other sorbent materials, for combustion; and these materials are forced upward in the device by the flow of combustion air and the gaseous products of combustion. Fluidized bed combustion technology includes, but is not limited to, bubbling bed units and circulating bed units.

(m) "Fuel pretreatment" means a process that removes a portion of the sulfur in a fuel before combustion of the fuel in a steam generating unit.

(n) "Heat input" means heat derived from combustion of fuel in a steam generating unit and does not include the heat derived from preheated combustion air, recirculated flue gases, or exhaust gases from other sources, such as stationary gas turbines, internal combustion engines and kilns.

(o) "Heat transfer medium" means any material that is used to transfer heat from one point to another point.

(p) "Maximum design heat input capacity" means the ability of a steam generating unit to combust a stated maximum amount of fuel, or combination of fuels, on a steady state basis as determined by the physical design and characteristics of the steam generating unit.

(q) "Natural gas" means:

1. A naturally occurring mixture of hydrocarbon and nonhydrocarbon gases found in geologic formations beneath the earth's surface, of which the principal constituent is methane, or

2. Liquified petroleum (LP) gas, as defined by the American Society for Testing and Materials in ASTM D1835-86, "Standard Specification for Liquified Petroleum Gases", incorporated by reference in s. NR 440.17.

(r) "Noncontinental area" means the state of Hawaii, the Virgin Islands, Guam, American Samoa, the commonwealth of Puerto Rico or the Northern Mariana Islands.

(s) "Oil" means crude oil or petroleum, or a liquid fuel derived from crude oil or petroleum, including distillate oil and residual oil.

(t) "Potential sulfur dioxide emission rate" means the theoretical SO_2 emissions, nanograms per joule (ng/J) or pounds per million Btu (lb/million

Btu) heat input, that would result from combusting fuel in an uncleansed state and without using emission control systems.

(u) "Process heater" means a device that is primarily used to heat a material to initiate or promote a chemical reaction to which the material participates as a reactant or catalyst.

(v) "Residual oil" means crude oil, fuel oil that does not comply with the specifications under the definition of distillate oil, and all fuel oil numbers 4, 5 and 6, as defined by the American Society for Testing and Materials in ASTM D396-78, "Standard Specification for Fuel Oils", incorporated by reference in s. NR 440.17.

(w) "Steam generating unit" means a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this section.

(x) "Steam generating unit operating day" means a 24-hour period between 12:00 midnight and the following midnight during which any fuel is combusted at any time in the steam generating unit. It is not necessary for fuel to be combusted continuously for the entire 24-hour period.

(y) "Wet flue gas desulfurization technology" means an SO_2 control system that is located between the steam generating unit and the exhaust vent or stack, and that removes sulfur oxides from the combustion gases of the steam generating unit by contacting the combustion gases with an alkaline slurry or solution and forming a liquid material. This definition includes devices where the liquid material is subsequently converted to another form. Alkaline reagents used in wet flue gas desulfurization systems include, but are not limited to, lime, limestone and sodium compounds.

(z) "Wet scrubber system" means any emission control device that mixes an aqueous stream or slurry with the exhaust gases from a steam generating unit to control emissions of particulate matter (PM) or SO_2.

(zm) "Wood" means wood, wood residue, bark or any derivative fuel or residue thereof, in any form, including but not limited to sawdust, sanderdust, wood chips, scraps, slabs, millings, shavings and processed pellets made from wood or other forest residues.

(3) STANDARDS FOR SULFUR DIOXIDE. (a) Except as provided in pars. (b), (c) and (e), on and after the date on which the initial performance test is completed or required to be completed under s. NR 440.08, whichever date comes

first, the owner the operator of an affected facility that combusts only coal shall neither:

1. Cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of 10% (0.10) of the potential SO_2 emission rate, 90% reduction; nor

2. Cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of 520 ng/J (1.2 lb/million Btu) heat input. If coal is combusted with other fuels, the affected facility is subject to the 90% SO_2 reduction requirement specified in this paragraph and the emission limit is determined pursuant to par. (e)2.

(b) Except as provided in pars. (c) and (e), on and after the date on which the initial performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, the owner or operator of an affected facility that:

1. Combusts coal refuse alone in a fluidized bed combustion steam generating unit shall neither:

a. Cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of 20% (0.20) of the potential SO_2 emission rate (80% reduction); nor

b. Cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of 520 ng/J (1.2 lb/million Btu) heat input. If coal is fired with coal refuse, the affected facility is subject to par. (a). If oil or any other fuel, except coal, is fired with coal refuse, the affected facility is subject to the 90% SO_2 reduction requirement specified in par. (a) and the emission limit determined pursuant to par. (e)2.

2. Combusts only coal and that uses an emergency technology for the control of SO_2 emissions shall neither:

a. Cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of 50% (0.50) of the potential SO_2 emission rate, 50% reduction; nor

b. Cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of 260 ng/J (0.60 lb/million Btu) heat input. If coal is combusted with other fuels, the affected facility is subject to the 50% SO_2 reduction requirement specified in this paragraph and the emission limit determined pursuant to par. (e)2.

(c) On and after the date on which the initial performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that combusts coal, alone or in combination with any other fuel, and is listed in subd. 1, 2, 3 or 4 shall cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of the emission limit determined pursuant to par. (e)2. Percent reduction requirements are not applicable to affected facilities under this paragraph.

1. Affected facilities that have a heat input of 22 MW (75 million Btu/hr) or less.

2. Affected facilities that have an annual capacity for coal of 55% (0.55) or less and are subject to a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor for coal of 55% (0.55) or less.

3. Affected facilities located in a noncontinental area.

4. Affected facilities that combust coal in a duct burner as part of a combined cycle system where 30% (0.30) or less of the heat entering the steam generating unit is from combustion of coal in the duct burner and 70% (0.70) or more of the heat entering the steam generating unit is from exhaust gases entering the duct burner.

(d) On and after the date on which the initial performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that combusts oil shall cause to be discharged into the atmosphere from that affected facility any gases that contains SO_2 in excess of 215 ng/J (0.50 lb/million Btu) heat input; or, as an alternative, no owner or operator of an affected facility that combusts oil shall combust oil in the affected facility that contains greater than 0.5 weight percent sulfur. The percent reduction requirements are not applicable to affected facilities under this paragraph.

(e) On and after the date on which the initial performance test is completed or required to be completed under s, NR 440.08, whichever dates comes first, no owner or operator of an affected facility that combusts coal, oil, or coal and oil with any other fuel shall cause to be discharged into the atmosphere from that affected facility any gases that contain SO_2 in excess of the following:

1. The percent of potential SO_2 emission rate required under paragraph (a) or (b)2, as applicable, for any affected facility that:

a. Combusts coal in combination with any other fuel,

b. Has a heat input capacity greater than 22 MW (75 million Btu/hr), and

c. Has an annual capacity factor for coal greater than 55% (0.55); and

2. The emission limit determined according to the following formula for any affected facility that combusts coal, oil, or coal and oil with any other fuel:

$$E_s = (K_aH_a + K_bH_b + K_cH_c)/(H_a + H_b + H_c)$$

where:

E_s is the SO_2 emission limit, expressed in ng/J or lb/million Btu heat input

K_a is 520 ng/J (1.2 lb/million Btu)

K_b is 260 ng/J (0.60 lb/million Btu)

K_c is 215 ng/J (0.50 lb/million Btu)

H_a is the heat input from the combustion of coal, except coal combusted in an affected facility subject to par. (b)2, in joules (J) (million Btu)

H_b is the heat input from the combustion of coal, except coal combusted in an affected facility subject to par. (b)2, in J (million Btu)

H_c is the heat input from the combustion of oil, in J (million Btu)

(f) Reduction in the potential SO_2 emission rate through fuel pretreatment is not credited toward the percent reduction requirement under par. (b)2 unless:

1. Fuel pretreatment results in a 50% (0.50) or greater reduction in the potential SO_2 emission rate; and

2. Emissions from the pretreated fuel, without either combustion or post-combustion SO_2 control, are equal to or less than the emission limits specified under par. (b)2.

(g) Except as provided in par. (h), compliance with the percent reduction requirements, fuel oil sulfur limits, and emission limits of this subsection shall be determined on a 30-day rolling average basis.

(h) For affected facilities listed under subd. 1, 2 or 3, compliance with the emission limits or fuel oil sulfur limits under this subsection may be determined based on a certification from the fuel supplier, as described under sub. (9)(f)1, 2 or 3, as applicable.

1. Distillate oil-fired affected facilities with heat input capacities between 2.9 and 29 MW (10 and 100 million Btu/hr).

2. Residual oil-fired affected facilities with heat input capacities between 2.9 and 8.7 MW (10 and 30 million Btu/hr).

3. Coal-fired facilities with heat input capacities between 2.9 and 8.7 MW (10 and 30 million Btu/hr).

(i) The SO_2 emission limits, fuel oil sulfur limits and percent reduction requirements under this subsection apply at all times, including periods of startup, shutdown and malfunction.

(j) Only the heat input supplied to the affected facility from the combustion of coal and oil is counted under this subsection. No credit is provided for the heat input to the affected facility from wood or other fuels or for heat derived from exhaust gases from other sources, such as stationary gas turbines, internal combustion engines and kilns.

(4) STANDARDS FOR PARTICULATE MATTER. (a) On and after the date on which the initial performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that combusts coal or combusts mixtures of coal with other fuels and has a heat input capacity of 8.7 MW (30 million Btu/hr) or greater, shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of the following emission limits:

1. 22 ng/J (0.05 lb/million Btu) heat input if the affected facility combusts only coal, or combusts coal with other fuels and has an annual capacity factor for the other fuels of 10% (0.10) or less.

2. 43 ng/J (0.10 lb/million Btu) heat input if the affected facility combusts coal with other fuels, has an annual capacity factor for the other fuels greater than 10% (0.10), and is subject to a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor greater than 10% (0.10) for fuels other than coal.

(b) On and after the date on which the initial performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that combusts mixtures of wood with other fuels, except coal, and has a heat input capacity of 8.7 MW (30 million Btu) or greater, shall cause to be discharged into the atmosphere from that affected facility any gases that contain PM in excess of the following emission limits:

1. 43 ng/J (0.10 lb/million Btu) heat input if the affected facility has an annual capacity factor for wood greater than 30% (0.30); or

2. 130 ng/J (0.30 lb/million Btu) heat input if the affected facility has an annual capacity factor for wood of 30% (0.30) or less and is subject to a federally enforceable requirement limiting operation of the affected facility to an annual capacity factor for wood of 30% (0.30) or less.

(c) On and after the date on which the initial performance test is completed or required to be completed under s. NR 440.08, whichever date comes first, no owner or operator of an affected facility that combusts coal, wood or oil and has a heat input capacity of 8.7 MW (30 lb/million Btu) or greater shall cause to be discharged into the atmosphere from that affected facility any gases that exhibit greater than 20% opacity (6-minute average), except for one 6-minute period per hour of not more than 27% opacity.

(d) The PM and opacity standards under this subsection apply at all times, except during periods of startup, shutdown or malfunction.

(5) COMPLIANCE AND PERFORMANCE TEST METHODS AND PROCEDURES FOR SULFUR DIOXIDE. (a) Except as provided in pars. (g) and (h) and in s. NR 440.08(2), performance tests required under s. NR 440.08 shall be conducted following the procedures specified in pars. (b) to (f), as applicable. The cited methods and procedures are in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17. Section NR 440.08(6) does not apply to this subsection. The 30-day notice required in s. NR 440.08(4) applies only to the initial performance test unless otherwise specified by the department.

(b) The initial performance test required under s. NR 440.08 shall be conducted over 30 consecutive operating days of the steam generating unit. Compliance with the percent reduction requirements and SO_2 emission limits under sub. (3) shall be determined using a 30-day average. The first operating day included in the initial performance test shall be scheduled within 30 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after the initial startup of the facility. The steam generating unit load during the 30-day period does not have to be the maximum design heat input capacity, but shall be representative of future operating conditions.

(c) After the initial performance test required under par. (b) and s. NR 440.08, compliance with the percent reduction requirements and SO_2 emission limits under sub. (3) is based on the average percent reduction and the average SO_2 emission rates for 30 consecutive steam generating unit operating days. A separate performance test is completed at the end of each steam generating unit operating day, and a new 30-day average percent reduction and SO_2 emission rate are calculated to show compliance with the standard.

(d) If only coal, only oil, or a mixture of coal and oil is combusted in an affected facility, the procedures in Method 19 are used to determine the hourly SO_2 emission rate (E_{so}) and the 30-day average SO_2 emission rate (E_{ho}). The hourly averages are obtained from the continuous emission monitoring system (CEMS). Method 19 shall be used to calculate E_{so} when using daily fuel sampling or Method 6B.

(e) If coal, oil, or coal and oil are combusted with other fuels:

1. An adjusted E_{ho} ($E_{ho}°$) is used in Equation 19-19 of Method 19 to compute the adjusted E_{ao} ($E_{ao}°$). The $E_{ho}°$ is computed using the following formula:

$$E_{ho}° = (E_{ho} - E_w(1 - X_k))/X_k$$

where:

$E_{ho}°$ is the adjusted E_{ho}, ng/J (lb/million Btu)

E_{ho} is the hourly SO_2 emission rate, ng/J (lb/million Btu)

E_w is the SO_2 concentration in fuels other than coal and oil combusted in the affected facility, as determined by fuel sampling and analysis procedures in Method 9, ng/J (lb/million Btu). The value E_w for each fuel lot is used for each hourly average during the time that the lot is being combusted. The owner or operator does not have to measure E_w if the owner or operator elects to assume $E_w = 0$

X_k is the fraction of the total heat input from fuel combustion derived from coal and oil, as determined by applicable procedures in Method 19

2. The owner or operator of an affected facility that qualifies under the provisions of sub. (3)(c) or (d), where percent reduction is not required, does not have to measure the parameters E_w or X_k if the owner or operator of the affected facility elects to measure emission rates of the coal or oil using the fuel sampling and analysis procedures under Method 19.

(f) Affected facilities subject to the percent reduction requirements under sub. (3)(a) or (b) shall determine compliance with the SO_2 emission limits under sub. (3) pursuant to pars. (d) or (e), and shall determine compliance with the percent reduction requirements using the following procedures:

1. If only coal is combusted, the percent of potential SO_2 emission rate is computed using the following formula:

$$\%P_s = 100(1 - \%R_g/100)(1 - \%R_f/100)$$

where:

$\%P_s$ is the percent of potential SO_2 emission rate, in percent

$\%R_g$ is the SO_2 removal efficiency of the control device as determined by Method 19, in percent

$\%R_f$ is the SO_2 removal efficiency of fuel pretreatment as determined by Method 19, in percent

2. If coal, oil, or coal and oil are combusted with other fuels, the same procedures required in subd. 1 are used, except as provided for in the following:

a. To compute the $\%P_s$, an adjusted $\%R_g$ ($\%R_g{}^\circ$) is computed from $E_{ao}{}^\circ$ from par. (e)1 and an adjusted SO_2 inlet rate ($E_{ai}{}^\circ$) using the following formula:

$$\%R_g{}^\circ = 100[1.0 - (E_{ao}{}^\circ/E_{ai})]$$

where:

$\%R_g{}^\circ$ is the adjusted $\%R_g$, in percent

$E_{ao}{}^\circ$ is the adjusted E_{ao}, ng/J (lb/million Btu)

$E_{ai}{}^\circ$ is the adjusted average SO_2 inlet rate, ng/J (lb/million Btu)

b. To compute $E_{ai}{}^\circ$, an adjusted hourly SO_2 inlet rate ($E_{hi}{}^\circ$) is used. The $E_{hi}{}^\circ$ is computed using the following formula:

$$E_{hi}{}^\circ = [E_{hi} - E_w\,(1 - X_k)]/X_k$$

where:

$E_{hi}{}^\circ$ is the adjusted E_{hi}, ng/J (lb/million Btu)

E_{hi} is the SO_2 concentration in fuels other than coal and oil combusted in the affected facility, as determined by fuel sampling and analysis procedures in Method 19, ng/J (lb/million Btu). The value E_w for each fuel lot is used for each hourly average during the time that the lot is being combusted. The owner or operator does not have to measure E_w if the owner or operator elects to assume $E_w = 0$

X_k is the fraction of the total heat input from fuel combustion derived from coal and oil, as determined by applicable procedures in Method 19

(g) For oil-fired affected facilities where the owner or operator seeks to demonstrate compliance with the fuel oil sulfur limits under sub. (3) based on shipment fuel sampling, the initial performance test shall consist of sampling and analyzing the oil in the initial tank of oil to be fired in the steam generating unit to demonstrate that the oil contains 0.5 weight percent sulfur or less. Thereafter, the owner or operator of the affected facility shall sample the oil in the fuel tank after each new shipment of oil is received, as described under sub. (7)(d)2.

(h) For affected facilities subject to sub. (3)(h)1, 2 or 3 where the owner or operator seeks to demonstrate compliance with the SO_2 standards based on fuel supplier certification, the performance test shall consist of the certification, the certification from the fuel supplier, as described under sub. (9)(f)1, 2 or 3, as applicable.

(i) The owner or operator of an affected facility seeking to demonstrate compliance with the SO_2 standards under sub. (3)(c)2 shall demonstrate the maximum design heat input capacity of the steam generating unit by operating the steam generating unit at this capacity for 24 hours. This demonstration shall be made during the initial performance test, and a subsequent demonstration may be requested at any other time. If the demonstrated 24-hour averaged firing rate for the affected facility is less than the maximum design heat input capacity stated by the manufacturer of the affected facility, the demonstrated 24-hour average firing rate shall be used to determine the annual capacity factor for the affected facility; otherwise, the maximum design heat input capacity provided by the manufacturer shall be used.

(j) The owner or operator of an affected facility shall use all valid SO_2 affected facility shall use all valid SO_2 emissions date in calculating $\%P_s$ and E_{ho} under pars. (d), (e) or (f), as applicable, whether or not the minimum emissions data requirements under sub. (7)(f) are achieved. All valid emissions data, including valid data collected during periods of startup, shutdown and malfunction shall be used in calculating $\%P_s$ or E_{ho} pursuant to pars. (d), (e) or (f), as applicable.

(6) COMPLIANCE AND PERFORMANCE TEST METHODS AND PROCEDURES FOR PARTICULATE MATTER. (a) The owner or operator of an affected facility subject to the PM standards, opacity standards, or both, under sub. (4) shall conduct an initial performance test as required under s. NR 440.08, and shall conduct subsequent performance tests as requested by the department, to determine compliance with the standards using the following procedures and reference methods. Unless otherwise indicated, these procedures and reference methods are in 40 CFR part 60, Appendix A, which is incorporated by reference in s. NR 440.17.

1. Method 1 shall be used to select the sampling site and the number of traverse sampling points. The sampling time for each run shall be at least 120 minutes and the minimum sampling volume shall be 1.7 dry square cubic meters (dscm) [60 dry square cubic feet (dscf)] except that smaller sampling times or volumes may be approved by the department when necessitated by process variables or other factors.

2. Method 3 shall be used for gas analysis when applying Method 5, Method 5B or Method 17.

3. Method 5, Method 5B or Method 17 shall be used to measure the concentration of PM as follows:

a. Method 5 may be used only at the affected facilities without wet scrubber systems.

b. Method 17 may be used at affected facilities with or without wet scrubber systems provided the stack gas temperature does not exceed a temperature of 160°C (320°F). The procedures of Sections 2.1 and 2.3 of Method 5B may be used in Method 17 only if Method 17 is used in conjunction with a wet scrubber system. Method 17 may not be used in conjunction with a wet scrubber system if the effluent is saturated or laden with water droplets.

c. Method 5B may be used in conjunction with a wet scrubber system.

4. For Method 5 or Method 5B, the temperature of the sample gas in the probe and filter holder shall be monitored and maintained at 160°C (320°F).

5. For determination of PM emissions, an oxygen or carbon dioxide measurement shall be obtained simultaneously with each run of Method 5, Method 5B or Method 17 by traversing the duct at the same sampling location.

6. For each run using Method 5, Method 5B or Method 17, the emission rates expressed in ng/J (lb/million Btu) heat input shall be determined using:

a. The oxygen or carbon dioxide measurements and PM measurements obtained under this subsection,

b. The dry basis F-factor, and

c. The dry basis emission rate calculation procedure contained in Method 19.

7. Method 9 (6-minute average of 24 observations) shall be used for determining the opacity of stack emissions.

(b) The owner or operator of an affected facility seeking to demonstrate compliance with the PM standards under sub. (4)(b)2 shall demonstrate the maximum design heat input capacity of the steam generating unit by operating the steam generating unit at this capacity for 24 hours. This demonstration shall be made during the initial performance test, and a subsequent demonstration may be requested at any other time. If the demonstrated 24-hour average firing rate for the affected facility is less than the maximum design heat input capacity stated by the manufacturer of the affected facility, the demonstrated 24-hour average firing rate shall be used to the determine annual capacity factor for the affected facility; otherwise, the maximum design heat input capacity provided by the manufacturer shall be used.

(7) EMISSION MONITORING FOR SULFUR DIOXIDE. (a) Except as provided in pars. (d) and (e), the owner or operator of an affected facility subject to the SO_2 emission limits under sub. (3) shall install, calibrate, maintain and operate a CEMS for measuring SO_2 concentrations and either oxygen or carbon dioxide concentrations at the outlet of the SO_2 control device (or the outlet of the steam generating unit if no SO_2 control device is used), and shall record the output of the system. The owner or operator of an affected facility subject to the percent reduction requirements under sub. (3) shall measure SO_2 concentrations and either oxygen or carbon dioxide concentrations at both the inlet and outlet of the SO_2 control device.

(b) The 1-hour average SO_2 emission rates measured by a CEM shall be expressed in ng/J or lb/million Btu heat input and shall be used to calculate the average emission rates under sub. (3). Each 1-hour average SO_2 emission rate shall be based on at least 30 minutes of operation and include at least 2 data points representing 2 15-minute periods. Hourly SO_2 emission rates are not calculated if the affected facility is operated less than 30 minutes in a 1-hour period and are not counted toward determination of a steam generating unit operating day.

(c) The procedure under s. NR 440.13 shall be followed for installation, evaluation and operation of the CEMS.

1. All CEMS shall be operated in accordance with the applicable procedures under Performance Specifications 1, 2 and 3 of 40 CFR part 60 Appendix B, incorporated by reference in s. NR 440.17.

2. Quarterly accuracy determinations and daily calibration drift tests shall be performed in accordance with Procedure 1 of 40 CFR part 60 Appendix F, incorporated by reference in s. NR 440.17.

3. For affected facilities subject to the percent reduction requirements under sub. (3), the span value of the SO_2 CEMS at the inlet to the SO_2 control device shall be 125% of the maximum estimated hourly potential SO_2 emission rate of the fuel combusted, and the span value of the SO_2 CEMS at the outlet from the SO_2 control device shall be 50% of the maximum estimated hourly potential SO_2 rate of the fuel combusted.

4. For affected facilities that are not subject to the percent reduction requirements of sub. (3), the span value of the SO_2 CEMS at the outlet from the SO_2 control device, or outlet of the steam generating unit if no SO_2 control device is used, shall be 125% of the maximum estimated hourly potential SO_2 emission rate of the fuel combusted.

(d) As an alternative to operating a CEMS at the inlet to the SO_2 control device, or outlet of the steam generating unit if no SO_2 control device is used, as required under par. (a), an owner or operator may elect to determine the average SO_2 emission rate by sampling the fuel prior to combustion. As an alternative to operating a CEM at the outlet from the SO_2 control device, or outlet of the steam generating unit if no SO_2 control device is used, as required under par. (a), an owner or operator may elect to determine the average SO_2 emission rate by using Method 6B. Fuel sampling shall be conducted pursuant to either subd. 1 or 2. Method 6B shall be conducted pursuant to subd. 3.

1. For affected facilities combusting coal or oil, coal or oil samples shall be collected daily in an as-fired condition at the inlet to the steam generating unit and analyzed for sulfur content and heat content according to Method 19. Method 19 provides procedures for converting these measurements into the format to be used in calculating the average SO_2 input rate.

2. As an alternative fuel sampling procedure for affected facilities combusting oil, oil samples may be collected from the fuel tank for each steam generating unit immediately after the fuel tank is filled and before any oil is combusted. The owner or operator of an affected facility shall analyze the oil sample to determine the sulfur content of the oil. If a partially empty

fuel tank is refilled, a new sample and analysis of the fuel in the tank is required upon filling. Results of the fuel analysis taken after each new shipment of oil is received shall be used as the daily value when calculating the 30-day rolling average until the next shipment is received. If the fuel analysis shows that the sulfur content in the fuel tank is greater than 0.5 weight percent sulfur, the owner or operator shall ensure that the sulfur content of subsequent oil shipments is low enough to cause the 30-day rolling average sulfur content to be 0.5 weight percent sulfur or less.

3. Method 6B may be used in lieu of CEMS to measure SO_2 at the inlet or outlet of the SO_2 control system. An initial stratification test is required to verify the adequacy of the Method 6B sampling location. The stratification test shall consist of 3 paired runs of a suitable SO_2 and carbon dioxide measurement train operated at the candidate location and a second similar train operated according to the procedures in s. 3.2 and the applicable procedures in section 7 of Performance Specification 2 of 40 CFR part 60 Appendix B, incorporated by reference in s. NR 440.17. Method 6B, Method 6A or a combination of Methods 6 and 3 or Methods 6C and 3A are suitable measurement techniques. If Method 6B is used for the second train, sampling time and timer operation may be adjusted for the stratification test as long as an adequate sample volume is collected; however, both sampling trains are to be operated similarly. For the location to be adequate for Method 6B 24-hour tests, then the mean of the absolute difference between the 3 paired runs shall be less than 10% (0.10).

(e) The monitoring requirements of pars. (a) and (d) do not apply to affected facilities subject to sub. (3)(h)1, 2 or 3 where the owner or operator of the affected facility seeks to demonstrate compliance with the SO_2 standards based on fuel supplier certification, or as described under sub. (9)(f)1, 2 or 3, as applicable.

(f) The owner or operator of an affected facility operating a CEMS pursuant to par. (a), or conducting as-fired fuel sampling pursuant to par. (d)1, shall obtain emission data for at least 75% of the operating hours in at least 22 out of 30 successive steam generating unit operating days. If this minimum data requirement is not met with a single monitoring system, the owner or operator of the affected facility shall supplement the emission data with data collected with other monitoring systems as approved by the department.

(8) EMISSION MONITORING FOR PARTICULATE MATTER. (a) The owner or operator of an affected facility combusting coal, residual oil or wood that is subject to the opacity standards under sub. (4) shall install, calibrate, maintain and operate a CEMS for measuring the opacity of the emissions discharged to the atmosphere and record the output of the system.

(b) All CEMS for measuring opacity shall be operated in accordance with the applicable procedures under Performance Specification 1 of 40 CFR part 60 Appendix B, incorporated by reference in s. NR 440.17. The span value of the opacity CEMS shall be between 60 and 80%.

(9) REPORTING AND RECORDKEEPING REQUIREMENTS. (a) The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction, anticipated startup and actual startup, as provided by s. NR 440.07. This notification shall include:

1. The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.

2. If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under sub. (3) or (4).

3. The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.

4. Notification if an emerging technology will be used for controlling SO_2 emissions. The administrator shall examine the description of the control device and determine whether the technology qualifies as an emerging technology. In making this determination, the administrator may require the owner or operator of an affected facility to submit additional information concerning the control device. The affected facility is subject to the provisions of sub. (3)(a) or (b)1, unless and until this determination is made by the administrator.

(b) The owner or operator of each affected facility subject to the SO_2 emission limits of sub. (3), or the PM or opacity limits of sub. (4), shall submit to the department the performance test data from the initial and any subsequent performance tests and, if applicable, the performance evaluation of the CEMS using the applicable performance specifications in Appendix B of 40 CFR part 60, incorporated by reference in s. NR 440.17.

(c) The owner or operator of each coal-fired, residual oil-fired, or wood-fired affected facility subject to the opacity limits under sub. (4)(c) shall submit excess emission reports for any calendar quarter for which there are excess emissions from the affected facility. If there are no excess emissions during the calendar quarter, the owner or operator shall submit a report semiannually stating that no excess emissions occur during the semiannual reporting period. The initial quarterly report shall be postmarked by the 30th day of the third month following the completion of the initial performance test, unless no excess emissions occur during that quarter. The initial semiannual report shall be postmarked by the 30th day of the sixth month following the completion of the initial performance test, or following the date of the previous quarterly report, as applicable. Each subsequent quarterly or semiannual report shall be postmarked by the 30th day following the end of the reporting period.

(d) The owner or operator of each affected facility subject to the SO_2 emission limits, fuel oil sulfur limits or percent reduction requirements under sub. (3) shall submit quarterly reports to the department. The initial quarterly report shall be postmarked by the 30th day of the third month following the completion of the initial performance test. Each subsequent quarterly report shall be postmarked by the 30th day following the end of the reporting period.

(e) The owner or operator of each affected facility subject to the SO_2 emission limits, fuel oil sulfur limits or percent reduction requirements under sub. (4) shall keep records and submit quarterly reports as required under par. (d), including the following information, as applicable:

1. Calendar dates covered in the reporting period.

2. Each 30-day average SO_2 emission rate (ng/J or lb/million Btu), or 30-day average sulfur content (weight percent), calculated during the reporting period, ending with the last 30-day period in the quarter; reasons for any noncompliance with the emission standards; and a description of corrective actions taken.

3. Each 30-day average percent of potential SO_2 emission rate calculated during the reporting period, ending with the last 30-day period in the quarter; reasons for any noncompliance with the emission standards; and a description of corrective actions taken.

4. Identification of any steam generating unit operating days for which SO_2 or diluent, oxygen or carbon dioxide, data have not been obtained by an approved method for at least 75% of the operating hours; justification for not obtaining sufficient data; and a description of corrective actions taken.

5. Identification of any times when emissions data have been excluded from the calculation of average emission rates; justification for excluding data; and a description of corrective actions taken if data have been excluded for periods other than those during which coal or oil were not combusted in the steam generating unit.

6. Identification of the F factor used in calculations, method of determination and type of fuel combusted.

7. Identification of whether averages have been obtained based on CEMS rather than manual sampling methods.

8. If a CEMS is used, identification of any times when the pollutant concentration exceeded the full span of the CEMS.

9. If a CEMS is used, description of any modifications to the CEMS that could affect the ability of the CEMS to comply with Performance Specifications 2 or 3 in Appendix B of 40 CFR part 60, incorporated by reference in s. NR 440.17.

10. If a CEMS is used, results of daily CEMS drift tests and quarterly accuracy assessments as required under Appendix F, Procedure 1 of 40 CFR part 60, incorporated by reference in s. NR 440.17.

11. If fuel supplier certification is used to demonstrate compliance, records of fuel supplier certification as described under par. (f)1, 2 or 3, as applicable. In addition to records of fuel supplier certifications, the quarterly report shall include a certified statement signed by the owner or operator of the affected facility that the records of fuel supplier certifications submitted represent all of the fuel combusted during the quarter.

(f) Fuel supplier certification shall include the following information:

1. For distillate oil:

a. The name of the oil supplier; and

b. A statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil in sub. (2).

2. For residual oil:

a. The name of the oil supplier;

b. The location of the oil when the sample was drawn for analysis to determine the sulfur content of the oil, specifically including whether the oil was sampled as delivered to the affected facility, or whether the sample was drawn from oil in storage at the oil supplier's or oil refiner's facility, or other location;

c. The sulfur content of the oil from which the shipment came, or of the shipment itself; and

d. The method used to determine the sulfur content of the oil.

3. For coal:

a. The name of the coal supplier;

b. The location of the coal when the sample was collected for analysis to determine the properties of the coal, specifically including whether the coal was sampled as delivered to the affected facility or whether the sample was collected from coal in storage at the mine, at a coal preparation plant, at a coal supplier's facility or at another location. The certification shall include the name of the coal mine, and coal seam, coal storage facility or coal preparation plant, where the sample was collected;

c. The results of the analysis of the coal from which the shipment came, or of the shipment itself, including the sulfur content, moisture content, ash content and heat content; and

d. The methods used to determine the properties of the coal.

(g) The owner or operator of each affected facility shall record and maintain records of the amounts of each fuel combusted during each day.

(h) The owner or operator of each affected facility subject to a federally enforceable requirement limiting the annual capacity factor for any fuel or mixture of fuels under sub. (3) or (4) shall calculate the annual capacity factor individually for each fuel combusted. The annual capacity factor is determined on a 12-month rolling average basis with a new annual capacity factor calculated at the end of the calendar month.

(i) All records required under this subsection shall be maintained by the owner or operator of the affected facility for a period of 2 years following the date of such record.

SECTION 57. NR 440.21(5) is repealed and recreated to read:

NR 440.21(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standard in sub. (3) as follows:

1. The emission rate (C_{12}) of particulate matter, corrected to 12% CO_2, shall be computed for each run using the following equation:

$$C_{12} = C_s \ (12/\%CO_2)$$

where:

C_{12} is the concentration of particulate matter corrected to 12% CO_2 g/dscm (gr/dscf)

C_s is the concentration of particulate matter, g/dscm (gr/dscf)

$\%CO_2$ is the CO_2 concentration, percent dry basis

2. Method 5 shall be used to determine the particulate matter concentration (C_s). The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The emission rate correction factor, integrated or grab sampling and analysis procedure of Method 3B shall be used to determine CO_2 concentration ($\%CO_2$).

a. The CO_2 sample shall be obtained simultaneously with, and at the same traverse points as, the particulate run. If the particulate run has more than 12 traverse points, the CO_2 traverse points may be reduced to 12 if Method 1 is used to locate the 12 CO_2 traverse points. If individual CO_2 samples are taken at each traverse point, the CO_2 concentration ($\%CO_2$) used in the correction equation shall be the arithmetic mean of all the individual CO_2 sample concentrations at each traverse point.

b. If sampling is conducted after a wet scrubber, an "adjusted" CO_2 concentration, $(\%CO_2)_{adj}$, which accounts for the effects of CO_2 absorption and dilution air, may be used instead of the CO_2 concentration determined in this paragraph. The adjusted CO_2 concentration shall be determined by either of the procedures in par. (c).

(c) The owner or operator may use either of the following procedures to determine the adjusted CO_2 concentration.

1. The volumetric flow rates at the inlet and outlet of the wet scrubber and the inlet CO_2 concentration may be used to determine the adjusted concentration, $(\%CO_2)_{adj}$, using the following equation:

$$(\%CO_2)_{adj} = (\%CO_2)_{di} \ (Q_{di}/Q_{do})$$

where:

$(\%CO_2)_{adj}$ is the adjusted outlet CO_2 concentration, percent dry basis

$(\%CO_2)_{di}$ is the CO_2 concentration measured before the scrubber, percent dry basis

Q_{di} is the volumetric flow rate of effluent gas before the wet scrubber, dscm/min (dscf/min)

Q_{do} is the volumetric flow rate of effluent gas after the wet scrubber, dscm/min (dscf/min)

a. At the outlet, Method 5 is used to determine the volumetric flow rate (Q_{do}) of the effluent gas.

b. At the inlet, Method 2 is used to determine the volumetric flow rate (Q_{di}) of the effluent gas as follows: Two full velocity traverses are conducted, one immediately before and one immediately after each particulate run conducted at the outlet, and the results are averaged.

c. At the inlet, the emission rate correction factor, integrated sampling and analysis procedure of Method 3B is used to determine the CO_2 concentration, $(\%CO_2)_{di}$, as follows: At least 9 sampling points are selected randomly from the velocity traverse points and are divided randomly into 3 sets, equal in number of points; the first set of 3 or more points is used for the first run, the second set for the second run, and the third set for the third run. The CO_2 sample is taken simultaneously with each particulate run being conducted at the outlet, by traversing the 3 sampling points, or more, and sampling at each point for equal increments of time.

2. Excess air measurements may be used to determine the adjusted CO_2 concentration, $(\%CO_2)_{adj}$, using the following equation:

$$(\%CO_2)_{adj} = (\%CO_2)_{di}\ [(100 + \%EA_i)/(100 + \%EA_o)]$$

where:

$(\%CO_2)_{adj}$ is the adjusted outlet CO_2 concentration, percent dry basis

$(\%CO_2)_{di}$ is the CO_2 concentration at the inlet of the wet scrubber, percent dry basis

$\%EA_i$ is the excess air at the inlet of the scrubber, percent

$\%EA_o$ is the excess air at the outlet of the scrubber, percent

a. A gas sample is collected as in subd. 1 c and the gas samples at both the inlet and outlet locations are analyzed for CO_2, O_2 and N_2.

b. Equation 3B-3 of Method 3B is used to compute the percentages of excess air at the inlet and outlet of the wet scrubber.

SECTION 58. NR 440.22(2)(b), (c) and (d) and (4)(b), (c), (d) and (e) are created to read:

NR 440.22(2)(b) "Bypass" means any system that prevents all or a portion of the kiln or clinker cooler exhaust gases from entering the main control device and ducts the gases through a separate control device. This does not include emergency systems designed to duct exhaust gases directly to the atmosphere in the event of a malfunction of any control device controlling kiln or clinker cooler emissions.

(c) "Bypass stack" means the stack that vents exhaust gases to the atmosphere from the bypass control device.

(d) "Monovent" means an exhaust configuration of a building or emission control device, for example a positive-pressure fabric filter, that extends the length of the structure and has a width very small in relation to its length, that is, length to width ratio is typically greater than 5:1. The exhaust may be an open vent with or without a roof, louvered vents or a combination of such features.

(4)(b) Except as provided for in par. (c), each owner or operator of a kiln or clinker cooler that is subject to the provisions of this section shall install, calibrate, maintain and operate in accordance with s. NR 440.13 a continuous opacity monitoring system to measure the opacity of the emissions discharged into the atmosphere from any kiln or clinker cooler. Except as provided for in par. (c), a continuous opacity monitoring system shall be installed on each stack of any multiple stack device controlling emissions from any kiln or clinker cooler. If there is a separate bypass installed, each owner or operator of a kiln or clinker cooler shall also install, calibrate, maintain and operate a continuous opacity monitoring system on each bypass stack in addition to the main control device stack. Each owner or operator of an affected kiln or clinker cooler for which the performance test required under s. NR 440.08 has been completed prior to December 14, 1988, shall install the continuous opacity monitoring system within 180 days after December 14, 1988.

(c) Each owner or operator of a kiln or clinker cooler subject to the provisions of this section using a positive-pressure fabric filter with multiple stacks, or an electrostatic precipitator with multiple stacks may, in lieu of installing the continuous opacity monitoring system required by par. (b), monitor visible emissions at least once per day by using a certified visible emissions observer. If the control device exhausts gases through a monovent, visible emissions observations in lieu of a continuous opacity monitoring system are required. These observations shall be taken in accordance with Method 9 of 40 CFR part 60 Appendix A, incorporated by reference in s. NR 440.17. Visible emissions shall be observed during conditions representative of normal operation. Observations shall be recorded for at least 3 6-minute periods each day. In the event that visible emissions are observed for a number of emission sites from the control device with multiple stacks, Method 9 observations shall be recorded for the emission site with the highest opacity. All records of visible emissions shall be maintained for a period of 2 years.

(d) For the purpose of reports under sub. (6), periods of excess emissions that shall be reported are defined as all 6-minute periods during which the average opacity exceeds that allowed by sub. (3)(a)2 or (b)2.

(e) The provisions of pars. (a), (b) and (c) apply to kilns and clinker coolers for which construction, modification or reconstruction commenced after August 17, 1971.

SECTION 59. NR 440.22(5) is repealed and recreated to read:

NR 440.22(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standard in sub. (3) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (c_s Q_{sd})/(PK)$$

where:

E is the emission rate of particulate matter, kg/metric ton (lb/ton) of kiln feed

c_s is the concentration of particulate matter, g/dscm (g/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P is the total kiln feed (dry basis) rate, metric ton/hr (ton/hr)

K is the conversion factor, 1000 g/kg (453.6 g/lb)

2. Method 5 shall be used to determine the particulate matter concentration (c_s) and the volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30.0 dscf) for the kiln and at least 60 minutes and 1.15 dscm (40.6 dscf) for the clinker cooler.

3. Suitable methods shall be used to determine the kiln feed rate (P), except fuels, for each run. Material balance over the production system shall be used to confirm the feed rate.

4. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 60. NR 440.22(6) is created to read:

NR 440.22(6) (title) RECORDKEEPING AND REPORTING REQUIREMENTS. (a) Each owner or operator required to install a continuous opacity monitoring system under sub. (4)(b) shall submit reports of excess emissions as defined in sub. (4)(d). The content of these reports shall comply with the requirements in s. NR 440.07(3). Notwithstanding the provisions of s. NR 440.07(3), reports shall be submitted semiannually.

(b) Each owner or operator monitoring visible emissions under sub. (4)(c) shall submit semiannual reports of observed excess emissions as defined in sub. (4)(d).

(c) Each owner or operator subject to the provisions of sub. (4)(c) shall submit semiannual reports of the malfunction information required to be recorded by s. NR 440.07(2). These reports shall include the frequency, duration and cause of any incident resulting in deenergization of any device controlling kiln emissions or in the venting of emissions directly to the atmosphere.

SECTION 61. NR 440.23(4)(a) is repealed and recreated to read:

NR 440.23(4)(a) The source owner or operator shall install, calibrate, maintain and operate a continuous monitoring system for measuring nitrogen oxides (NO_x). The pollutant gas mixtures under Performance Specification 2 of Appendix B of 40 CFR part 60, incorporated by reference in s. NR 440.17, and for calibration checks under s. NR 440.13(4) shall be nitrogen dioxide (NO_2). The span value shall be 500 ppm of NO_2. Method 7 shall be used for the performance evaluation under s. NR 440.13(3). Acceptable alternative methods to Method 7 are given in sub. (5)(c).

SECTION 62. NR 440.23(4)(b) is amended to read:

NR 440.23(4)(b) The owner or operator shall establish a conversion factor for the purpose of converting monitoring data into units of the applicable standard (kg/metric ton, lb/~~short~~ ton). The conversion factor shall be established by measuring emissions with the continuous monitoring system concurrent with measuring emissions with the applicable reference method tests. Using only that portion of the continuous monitoring emission data that represents emission measurements concurrent with the reference method test periods, the conversion factor shall be determined by dividing the reference method test data averages by the monitoring data averages to obtain a ratio expressed in units of the applicable standard to units of the monitoring data, i.e., kg/metric ton per ppm (lb/~~short~~ ton per ppm). The conversion factor shall be reestablished during any performance test under s. NR 440.08 or any continuous monitoring system performance evaluation under s. NR 440.13(3).

SECTION 63. NR 440.23(5) is repealed and recreated to read:

NR 440.23(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2). Acceptable alternative methods and procedures are given in par. (c).

(b) The owner or operator shall determine compliance with the NO_x standard in sub. (3) as follows:

1. The emission rate (E) of NO_x shall be computed for each run using the following equation:

$$E = (C_s\ Q_{sd})/(PK)$$

where:

E is the emission rate of NO_x as NO_2, kg/metric ton (lb/ton) of 100% nitric acid

C_s is the concentration of NO_x as NO_2, g/dscm (lb/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P is the acid production rate, metric ton/hr (ton/hr) or 100% nitric acid.

K is the conversion factor, 1000 g/kg (1.0 lb/lb)

2. Method 7 shall be used to determine the NO_x concentration of each grab sample. Method 1 shall be used to select the sampling site and the sampling point shall be the centroid of the stack or duct or at a point no closer to the walls than 1 m (3.28 ft). Four grab samples shall be taken at approximately 15-minute intervals. The arithmetic mean of the 4 sample concentrations shall constitute the run value (C_s).

3. Method 2 shall be used to determine the volumetric flow rate (Q_{sd}) of the effluent gas. The measurement site shall be the same as for the NO_x sample. A velocity traverse shall be made once per run within the hour that the NO_x samples are taken.

4. The methods of sub. (4)(c) shall be used to determine the production rate (P) of 100% nitric acid for each run. Material balance over the production system shall be used to confirm the production rate.

(c) The owner or operator may use the following as alternatives to the methods and procedures specified in this subsection:

1. For Method 7, Method 7A, 7B, 7C or 7D may be used. If Method 7C or 7D is used, the sampling time shall be at least 1 hour.

(d) The owner or operator shall use the procedure in sub. (4)(b) to determine the conversion factor for converting the monitoring data to the units of the standard.

SECTION 64. NR 440.24(5)(a) and (b) are amended to read:

NR 440.24(5)(a) A continuous monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained and operated by the owner or operator. The pollutant gas used to prepare calibration gas mixtures under Performance Specification 2 of 40 CFR part 60, Appendix B, incorporated by reference in s. NR 440.17, and for calibration checks under s. NR 440.13(4) shall be sulfur dioxide (SO_2). ~~Reference~~ Method 8 of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, shall be used for conducting monitoring system performance evaluations under s. NR 440.13(3), except that only the sulfur dioxide portion of the Method 8 results shall be used. The span <u>value</u> shall be set at 1000 ppm of sulfur dioxide.

(b) The owner or operator shall establish a conversion factor for the purpose of converting monitoring data into units of the applicable standard (kg/metric ton, lb/~~short~~ ton). The conversion factor shall be determined, at a minimum, 3 times daily by measuring the concentration of sulfur dioxide entering the converter using suitable methods (e.g., the Reich test, National Air Pollution Control Administration Publication No. 999-AP-13) and calculating the appropriate conversion factor for each 8-hour period as follows:

$$CF = k[(1.000 - 0.015r)/(r - s)]$$

where CF is the conversion factor (kg/metric ton per ppm, lb/~~short~~ ton per ppm), and k is the constant derived from material balance. For determining CF in metric units, k = 0.0653. For determining CF in English units, k = 0.1306. r is the percentage of sulfur dioxide by volume entering the gas converter. Appropriate corrections must be made for air injection plants subject to the department's approval. s is the percentage of sulfur dioxide by volume in the emissions to the atmosphere determined by the continuous monitoring system required under par. (a).

SECTION 65. NR 440.24(5)(d) and (6) are repealed and recreated to read:

NR 440.24(5)(d) Alternatively, a source that processes elemental sulfur or an area that contains elemental sulfur and uses air to supply oxygen may use the following continuous emission monitoring approach and calculation procedures in determining SO_2 emission rates in terms of the standard. This procedure is not required but is an alternative that would alleviate problems encountered in the measurement of gas velocities or production rate. Continuous emission monitoring of SO_2, O_2 and CO_2, if required, shall be installed, calibrated, maintained and operated by the owner or operator and subjected to the certification procedures in Performance Specifications 2 and

3. The calibration procedure and span value for this SO_2 monitor shall be as specified in par. (b). The span value for CO_2, if required, shall be 10% and for O_2 shall be 20.9% (air). A conversion factor based on process rate data is not necessary. Calculate the SO_2 emission rate as follows:

$$E_s = (C_s S)/[0.265 - (0.0126\ \%O_2) - (A\ \%CO_2)]$$

where:

E_s is the SO_2 emission rate in kg/metric ton (lb/ton) of 100% of H_2SO_4 produced

C_s is the concentration of SO_2, kg/dscm (lb/dscf) (see table below)

S is the acid production rate factor, 368 dscm/metric ton (11,800 dscf/ton) of 100% H_2SO_4 produced

$\%O_2$ is the Oxygen concentration, percent dry basis

A is the auxiliary fuel factor,

= 0.00 for no fuel
= 0.0226 for methane
= 0.0217 for natural gas
= 0.0196 for propane
= 0.0172 for #2 oil
= 0.0161 for #6 oil
= 0.0148 for coal
= 0.0126 for coke

$\%CO_2$ is the carbon dioxide concentration, percent dry basis

Note: It is necessary in some cases to convert measured concentration units to other units for these calculations. Use the following table for such conversions:

From	To	Multiply by
g/scm	kg/scm	10^{-3}
mg/scm	kg/scm	10^{-6}
ppm (SO_2)	kg/scm	2.660×10^{-4}
ppm (SO_2)	lb/scm	1.660×10^{-7}

(6) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated

by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2). Acceptable alternative methods and procedures are given in par. (c).

(b) The owner or operator shall determine compliance with the SO_2 acid mist, and visible emission standards in subs. (4) and (5) as follows:

1. The emission rate (E) of acid mist or SO_2 shall be computed for each run using the following equation:

$$E = (CQ_{sd})/(PK)$$

where:

E is the emission rate of acid mist or SO_2 kg/metric ton (lb/ton) of 100% H_2SO_4 produced

C is the concentration of acid mist or SO_2, g/dscm (lb/dscf)

Q_{sd} is the volumetric flow rate of the effluent gas, dscm/hr (dscf/hr)

P is the production rate of 100% H_2SO_4, metric ton/hr (ton/hr)

K is the conversion factor, 1000 g/kg (1.0 lb/lb)

2. Method 8 shall be used to determine the acid mist and SO_2 concentrations (C's) and the volumetric flow rate (Q_{sd}) of the effluent gas. The moisture content may be considered to be zero. The sampling time and sample volume for each run shall be at least 60 minutes and 1.15 dscm (40.6 dscf).

3. Suitable methods shall be used to determine the production rate (P) of 100% H_2SO_4 for each run. Material balance over the production system shall be used to confirm the production rate.

4. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(c) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this subsection:

1. If a source processes elemental sulfur or an ore that contains elemental sulfur and uses air to supply oxygen, the following procedure may be used instead of determining the volumetric flow rate and production rate:

a. The integrated technique of Method 3 is used to determine the O_2 concentration and, if required, CO_2 concentration.

b. The SO_2 or acid mist emission rate is calculated as described in sub. (5)(d), substituting the acid mist concentration for C_s as appropriate.

SECTION 66. NR 440.25(4) is repealed and recreated to read:

NR 440.25(4) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf).

2. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 67. NR 440.26(1) (title) and (b) are amended to read:

NR 440.26(1)(title) APPLICABILITY, DESIGNATION OF AFFECTED FACILITY, AND RECONSTRUCTION.

(b) Any fluid catalytic cracking unit catalyst regenerator or fuel gas combustion device under par. (a) which commences construction or modification after June 11, 1973 or any Claus sulfur recovery plant under par. (a) which commences construction or modification after October 4, 1976, is subject to the requirements of this section <u>except as provided under pars. (c) and (d)</u>.

SECTION 68. NR 440.26(1)(c), (d) and (e) are created to read:

NR 440.26(1)(c) Any fluid catalytic cracking unit catalyst regenerator under par. (b) which commences construction or modification on or before January 17, 1984, is exempted from sub. (5)(b).

(d) Any fluid catalytic cracking unit in which a contact material reacts with petroleum derivatives to improve feedstock quality and in which the contact material is regenerated by burning off coke, other deposits, or both and that commences construction or modification on or before January 17, 1984, is exempt from this section.

(e) For purposes of this section, under s. NR 440.15, the "fixed capital cost of the new components" includes the fixed capital cost of all depreciable components which are or will be replaced pursuant to all continuous programs of component replacement which are commenced within any 2-year period following January 17, 1984. For purposes of this paragraph, "commenced" means that an owner or operator has undertaken a continuous program of component replacement or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of component replacement.

SECTION 69. NR 440.26(2)(c) to (l) are renumbered 440.26(2)(g) to (p).

SECTION 70. NR 440.26(2)(c) to (f) and (q) are created to read:

NR 440.26(2)(c) "Contact material" means any substance formulated to remove metals, sulfur, nitrogen or any other contaminant from petroleum derivatives.

(d) "Fluid catalytic cracking unit" means a refinery process unit in which petroleum derivatives are continuously charged; hydrocarbon molecules in the presence of a catalyst suspended in a fluidized bed are fractured into smaller molecules or react with a contact material suspended in a fluidized bed to improve feedstock quality for additional processing; and the catalyst or contact material is continuously regenerated by burning off coke and other deposits. The unit includes the riser, reactor, regenerator, air blowers, spent catalyst or contact material recovery equipment, and regenerator equipment for controlling air pollutant emissions and for heat recovery.

(e) "Fluid catalytic cracking unit catalyst regenerator" means one or more regenerators (multiple regenerators) which comprise that portion of the fluid catalytic cracking unit in which coke burn-off and catalyst or contact material regeneration occurs, and includes the regenerator combustion air blower or blowers.

(f) "Fresh feed" means any petroleum derivative feedstock stream charged directly into the riser or reactor of a fluid catalytic cracking unit except for petroleum derivatives recycled within the fluid catalytic cracking unit, fractionator or gas recovery unit.

(q) "Valid day" means a 24-period in which at least 18 valid hours of data are obtained. A "valid hour" is one in which at least 2 valid data points are obtained.

SECTION 71. NR 440.26(3)(intro.) and (a)(intro.), (4)(intro.) and (a) and (5)(intro.) and (a) are repealed and recreated to read:

NR 440.26(3)(intro.) STANDARD FOR PARTICULATE MATTER. Each owner or operator of any fluid catalytic cracking unit catalyst regenerator that is subject to the requirements of this section shall comply with the emission limitations set forth in this subsection on and after the date on which the initial performance test, required by s. NR 440.08, is completed, but not later than 60 days after achieving the maximum production rate at which the fluid catalytic cracking unit catalyst regenerator will be operated, or 180 days after initial startup, whichever comes first.

(a)(intro.) No owner or operator subject to the provisions of this section shall discharge or cause the discharge into the atmosphere from any fluid catalytic cracking unit catalyst regenerator:

(4)(intro.) STANDARD FOR CARBON MONOXIDE. Each owner or operator of any fluid catalytic cracking unit catalyst regenerator that is subject to the requirements of this section shall comply with the emission limitations set forth in this subsection on and after the date on which the initial performance test, required by s. NR 440.08, is completed, but not later than 60 days after achieving the maximum production rate at which the fluid catalytic cracking unit catalyst regenerator will be operated, or 180 days after initial startup, whichever comes first.

(a) No owner or operator subject to the provisions of this section shall discharge or cause the discharge into the atmosphere from any fluid catalytic cracking unit catalyst regenerator any gases that contain carbon monoxide (CO) in excess of 500 ppm by volume (dry basis).

(5)(intro.) STANDARD FOR SULFUR DIOXIDE. Each owner or operator that is subject to the requirements of this section shall comply with the emission limitations set forth in this subsection on and after the date on which the initial performance test, required by s. NR 440.08, is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup, whichever comes first.

(a) No owner or operator subject to the provisions of this section shall:

1. Burn in any fuel gas combustion device any fuel gas that contains hydrogen sulfide (H_2S) in excess of 230 mg/dscm (0.10 gr/dscf). The combustion in a flare of process upset gases or fuel gas that is released to

the flare as a result of relief valve leakage or other emergency malfunctions is exempt from this paragraph.

2. Discharge or cause the discharge of any gases into the atmosphere from any Claus sulfur recovery plant containing in excess of:

a. For an oxidation control system or a reduction control system followed by incineration, 250 ppm by volume (dry basis) of sulfur dioxide (SO_2) at zero percent excess air.

b. For a reduction control system not followed by incineration, 300 ppm by volume of reduced sulfur compounds and 10 ppm by volume of hydrogen sulfide (H_2S), each calculated as ppm SO_2 by volume (dry basis) at zero percent excess air.

SECTION 72. NR 440.26(5)(b), (c) and (d) are created to read:

NR 440.26(5)(b) Each owner or operator that is subject to the provisions of this section shall comply with one of the following conditions for each affected fluid catalytic cracking unit catalyst regenerator:

1. With an add-on control device, reduce sulfur dioxide emissions to the atmosphere by 90% or maintain sulfur dioxide emissions to the atmosphere less than or equal to 50 ppm by volume (ppmv), whichever is less stringent; or

2. Without the use of an add-on control device, maintain sulfur oxides emissions calculated as sulfur dioxide to the atmosphere less than or equal to 9.8 kg/1,000 kg coke burn-off; or

3. Process in the fluid catalytic cracking unit fresh feed that has a total sulfur content no greater than 0.30% by weight.

(c) Compliance with par. (b)1, 2 or 3 is determined daily on a 7-day rolling average basis using the appropriate procedures outlined in sub. (7).

(d) A minimum of 22 valid days of data shall be obtained every 30 rolling successive calendar days when complying with par. (b)1.

SECTION 73. NR 440.26(6)(title) and (a) are repealed and recreated to read:

NR 440.26(6)(title) MONITORING OF EMISSIONS AND OPERATIONS.

(a) Continuous monitoring systems shall be installed, calibrated, maintained and operated by the owner or operator subject to the provisions of this section as follows:

1. For fluid catalytic cracking unit catalyst regenerators subject to sub. (3)(a)2, an instrument for continuously monitoring and recording the

opacity of emission into the atmosphere. The instrument shall be spanned at 60, 70 or 80% opacity.

2. For fluid catalytic cracking unit catalyst regenerators subject to sub. (4)(a), an instrument for continuously monitoring and recording the concentration by volume (dry basis) of CO emission into the atmosphere, except as provided in par. (a)2 b.

a. The span value for this instrument is 1,000 ppm CO.

b. A CO continuous monitoring system need not be installed if the owner or operator demonstrates that the average CO emission are less than 50 ppm on a dry basis and also files a written request for exemption to the department and receives an exemption. The demonstration shall consist of continuously monitoring CO emissions for 30 days using an instrument that shall meet the requirements of Performance Specification 4 of Appendix B of 40 CFR part 60, incorporated by reference in s. NR 440.17. The span value shall be 100 ppm CO instead of 1,000 ppm, and the relative accuracy limit shall be 10% of the average CO emission or 5 ppm CO, whichever is greater. For instruments that are identical to Method 10 of Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, and employ the sample conditioning system of Method 10A of Appendix A, the alternative relative accuracy test procedure in s. 10.1 of Performance Specification 2 of Appendix B may be used in place of the relative accuracy test.

3. For fuel gas combustion devices subject to sub. (5)(a)1, an instrument for continuously monitoring and recording the concentration by volume (dry basis, zero percent excess air) of SO_2 emission into the atmosphere, except where an H_2S monitor is installed under par. (a)4. The monitor shall include an oxygen monitor for correcting the data for excess air.

a. The span values for this monitor are 50 ppm SO_2 and 10% oxygen (O_2).

b. The SO_2 monitoring level equivalent to the H_2S standard under sub. (5)(a)1 shall be 20 ppm (dry basis, zero percent excess air).

c. The performance evaluations for this SO_2 monitor under s. NR 440.13(3) shall use Performance Specification 2. Methods 6 and 3 of Appendix A shall be used for conducting the relative accuracy evaluations. Method 6 samples shall be taken at a flow rate of approximately 2 liters/min for at least 30 minutes. The relative accuracy limit shall be 20% or 4 ppm, whichever is greater, and the calibration drift limit shall be 5% of the established span value.

d. Fuel gas combustion devices having a common source of fuel gas may be monitored at only one location, that is, after one of the combustion devices, if monitoring at this location accurately represents the SO_2 emission into the atmosphere from each of the combustion devices.

4. In place of the SO_2 monitor in par. (a)3, an instrument for continuously monitoring and recording the concentration (dry basis) of H_2S in fuel gases before being burned in any fuel gas combustion device.

a. The span value for this instrument is 425 mg/dscm H_2S.

b. Fuel gas combustion devices having a common source of fuel gas may be monitored at only one location, if monitoring at this location accurately represents the concentration of H_2S in the fuel gas begin burned.

c. The performance evaluations for this H_2S monitor under s. NR 440.13(3) shall use Performance Specification 7 of Appendix B. Method 11 of Appendix A shall be used for conducting the relative accuracy evaluations.

5. For Claus sulfur recovery plants with oxidation control systems or reduction control systems followed by incineration subject to sub. (5)(a)2 a, an instrument for continuously monitoring and recording the concentration (dry basis, zero percent excess air) of SO_2 emissions into the atmosphere. The monitor shall include an oxygen monitor for correcting the data for excess air.

a. The span values for this monitor are 500 ppm SO_2 and 10% O_2.

b. The performance evaluations for the SO_2 monitor under s. NR 440.13(3) shall use Performance Specification 2. Methods 6 and 3 shall be used for conducting the relative accuracy evaluations.

6. For Claus sulfur recovery plants with reduction control systems not followed by incineration subject to sub. (5)(a)2 b, an instrument for continuously monitoring and recording the concentration of reduced sulfur and O_2 emissions into the atmosphere. The reduced sulfur emission shall be calculated as SO_2 (dry basis, zero percent excess air).

a. The span values for this monitor are 450 ppm reduced sulfur and 10% O_2.

b. The performance evaluations for this reduced sulfur (and O_2) monitor under s. NR 440.13(3) shall use Performance Specification 5 of Appendix B, except the calibration drift specification is 2.5% of the span value rather than 5%. Methods 15 or 15A and Method 3 of Appendix A shall be used for conducting the relative accuracy evaluations. If Method 3 yields O_2 concentrations below 0.25% during the performance specification test, the O_2 concentration may be assumed to be zero and the reduced sulfur CEMS need not include an O_2 monitor.

7. In place of the reduced sulfur monitor under subd. 6, an instrument using an air or O_2 dilution and oxidation system to convert the reduced sulfur to SO_2 for continuously monitoring and recording the concentration (dry basis, zero percent excess air) of the resultant SO_2. The monitor shall include an oxygen monitor for correcting the data for excess oxygen.

a. The span values for this monitor are 375 ppm SO_2 and 10% O_2.

b. For reporting purposes, the SO_2 exceedance level for this monitor is 250 ppm (dry basis, zero percent excess air).

c. The performance evaluations for the SO_2 (and O_2) monitor under s. NR 440.13(3) shall use Performance Specification 5. Methods 15 or 15A and Method 3 shall be used for conducting the relative accuracy evaluations.

8. An instrument for continuously monitoring and recording concentrations of sulfur dioxide in the gases at both the inlet and outlet of the sulfur dioxide control device from any fluid catalytic cracking unit catalyst regenerator for which the owner or operator seeks to comply with sub. (5)(b)1. The span value of the inlet monitor shall be set at 125% of the maximum estimated hourly potential sulfur dioxide emission concentration entering the control device, and the span value of the outlet monitor shall be set at 50% of the maximum estimated hourly potential sulfur dioxide emission concentration entering the control device.

9. An instrument for continuously monitoring and recording concentrations of sulfur dioxide in the gases discharged into the atmosphere from any fluid catalytic cracking unit catalyst regenerator for which the owner or operator seeks to comply specifically with the 50 ppmv emission limit under sub. (5)(b)1. The span value of the monitor shall be set at 50% of the maximum hourly potential sulfur dioxide emission concentration entering the control device.

10. An instrument for continuously monitoring and recording concentrations of oxygen (O_2) in the gases at both the inlet and outlet of the sulfur dioxide control device (or the outlet only if specifically complying with the 50 ppmv standard) from any fluid catalytic cracking unit catalyst regenerator for which the owner or operator has elected to comply with sub. (5)(b)1. The span of the continuous monitoring system shall be set at 10%.

11. The continuous monitoring systems under par. (a)8, 9 and 10 are operated and data recorded during all periods of operation of the affected facility including periods of startup, shutdown or malfunction, except for

continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments.

12. The owner or operator shall follow Appendix F, Procedure 1, of 40 CFR part 60, incorporated by reference in s. NR 440.17, including quarterly accuracy determinations and daily calibration drift tests, for the continuous monitoring systems under subd. 8, 9 and 10.

13. When seeking to comply with sub. (5)(b)1, when emission data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, emission data will be obtained by using one of the following methods to provide emission data for a minimum of 18 hours per day in at least 22 out of 30 following successive calendar days:

a. The test methods as described in sub. (7)(k);
b. A spare continuous monitoring system; or
c. Other monitoring systems as approved by the administrator.

SECTION 74. NR 440.26(6)(c) and (d) are amended to read:

NR 440.26(6)(c) The average coke burn-off rate (thousands of kilograms per hour) and hours of operation shall be recorded daily for any fluid catalytic cracking unit catalyst regenerator subject to sub. (3), ~~or~~ (4) ~~shall be recorded daily~~ or (5)(b)2.

(d) For any fluid catalytic cracking unit catalyst regenerator ~~which is subject to sub. (3) and which utilizes~~ under sub. (3) that uses an incinerator-waste heat boiler to combust the exhaust gases from the catalyst regenerator, the owner or operator shall record daily the rate of combustion of liquid or solid fossil-fuels (liters/hr or kilograms/hr) and the hours of operation during which liquid or solid fossil-fuels are combusted in the incinerator-waste heater boiler.

SECTION 75. NR 440.26(6)(e) and (7) are repealed and recreated to read:

NR 440.26(6)(e) For the purpose of reports under s. NR 440.07(3), periods of excess emissions that shall be determined and reported are defined as follows:

Note: All averages, except for opacity, shall be determined as the arithmetic average of the applicable 1-hour averages, e.g., the rolling 3-hour average shall be determined as the arithmetic average of 3 contiguous 1-hour averages.

1. 'Opacity'. All 1-hour periods that contain 2 or more 6-minute periods during which the average opacity as measured by the continuous monitoring system under par. (a)1 exceeds 30%.

2. 'Carbon monoxide'. All 1-hour periods during which the average CO concentration as measured by the CO continuous monitoring system under par. (a)2 exceeds 500 ppm.

3. 'Sulfur dioxide from fuel gas combustion'. a. All rolling 3-hour periods during which the average concentration of SO_2 as measured by the SO_2 continuous monitoring system under par. (a)3 exceeds 20 ppm (dry basis, zero percent excess air); or

b. All rolling 3-hour periods during which the average concentration of H_2S as measured by the H_2S continuous monitoring system under par. (a)4 exceeds 230 mg/dscm (0.10 gr/dscf).

4. 'Sulfur dioxide from Claus sulfur recovery plants'. a. All 12-hour periods during which the average concentration of SO_2 as measured by the SO_2 continuous monitoring system under par. (a)5 exceeds 250 ppm (dry basis, zero percent excess air); or

b. All 12-hour periods during which the average concentration of reduced sulfur (as SO_2) as measured by the reduced sulfur continuous monitoring system under par. (a)6 exceeds 300 ppm; or

c. All 12-hour periods during which the average concentration of SO_2 as measured by the SO_2 continuous monitoring system under par. (a)7 exceeds 250 ppm (dry basis, zero percent excess air).

(7) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter (PM) standards in sub. (3)(a) as follows:

1. The emission rate (E) of PM shall be computed for each run using the following equation:

$$E = \frac{K\ c_s\ Q_{sd}}{R_c}$$

where:

E is the emission rate of PM, kg/1000 kg (lb/1000 lb) of coke burn-off

c_s is the concentration of PM, g/dscm (lb/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

R_c is the coke burn-off rate, kg coke/hr (1000 lb coke/hr)

K is the conversion factor, 1.0 $(kg^2/g)/(1000\ kg)$ $[10^3\ lb/(1000\ lb)]$

2. Method 5B or 5F is to be used to determine particulate matter emissions and associated moisture content from affected facilities without wet FGD systems; only Method 5B is to be used after wet FGD systems. The sampling time for each run shall be at least 60 minutes and the sampling time for each run shall be at least 0.015 dscm/min (0.53 dscf/min) except that shorter sampling times may be approved by the department when process variables or other factors preclude sampling for at least 60 minutes.

3. The coke burn-off rate (R_c) shall be computed for each run using the following equation:

$$R_c = K_1Q_r(\%CO_2 + \%CO)K_2Q_a - K_sQ_r[(\%CO/2) + \%CO_2 + \%O_2]$$

where:

R_c is the coke burn-off rate, kg/hr (1000 lb/hr)

Q_r is the volumetric flow rate of exhaust gas from catalyst regenerator before entering the emission control system, dscm/min (dscf/min)

Q_a is the volumetric flow rate of air to FCCU regenerator, as determined from the fluid catalytic cracking unit control room instrumentation, dscm/min (dscf/min)

$\%CO_2$ is the carbon dioxide concentration percent by volume (dry basis)

$\%CO$ is the carbon monoxide concentration, percent by volume (dry basis)

$\%O_2$ is the oxygen concentration, percent by volume (dry basis)

K_1 is the material balance and conversion factor, 0.2982 (kg-min)/(hr-dscm-%) [0.0186 (lb-min)/(hr-dscf-%)]

K_2 is the material balance and conversion factor, 2.088 (kg-min)/(hr-dscm-%) [0.1303 (lb-min)/(hr-dscf-%)]

K_3 is the material balance and conversion factor, 0.0994 (kg-min)/(hr-dscm-%) [0.0062 (lb/min)/(hr-dscf-%)]

a. Method 2 shall be used to determine the volumetric flow rate (Q_r)

b. The emission correction factor, integrated sampling and analysis procedure of Method 3 shall be used to determine CO_2, CO and O_2 concentrations.

4. Method 9 and the procedures of s. NR 440.11 shall be used to determine opacity.

(c) If auxiliary liquid or solid fossil fuels are burned in an incinerator-waste heat boiler, the owner or operator shall determine the emission rate of PM permitted in sub. (3)(b) as follows:

1. The allowable emission rate (E_s) of PM shall be computed for each run using the following equation:

$$E_s = 1.0 + A\ (H/R_c)K'$$

where:

E_s is the emission rate of PM allowed, kg/1000 kg (lb/1000 lb) of coke burn-off in catalyst regenerator

1.0 is the emission standard, kg coke/1000 kg (lb coke/1000 lb)

A is the allowable incremental rate of PM emission, 0.18 g/million cal (0.10 lb/million Btu)

H is the heat input rate from solid or liquid fossil fuel, million cal/hr (million Btu/hr)

R_c is the coke burn-off rate, kg coke/hr (1000 lb coke/hr)

K′ is the conversion factor to units of standard, 1.0 $(kg^2/g)/(1000\ kg)$ $[10^3 lb/(1000\ lb)]$

2. Procedures subject to the approval of the department shall be used to determine the heat input rate.

3. The procedure in par. (b)3 shall be used to determine the coke burn-off rate (R_c).

(d) The owner or operator shall determine compliance with the CO standard in sub. (4)(a) by using the integrated sampling technique of Method 10 to determine the CO concentration (dry basis). The sampling time for each run shall be 60 minutes.

(e) The owner or operator shall determine compliance with the H_2S standard in sub. (5)(a)1 as follows: Method 11 shall be used to determine the H_2S concentration. The gases entering the sampling train should be at about atmospheric pressure. If the pressure in the refinery fuel gas lines is relatively high, a flow control valve may be used to reduce the pressure. If the line pressure is high enough to operate the sampling train without a vacuum pump, the pump may be eliminated from the sampling train. The sample shall be drawn from a point near the centroid of the fuel gas line. The sampling time and sample volume shall be at least 10 minutes and 0.010 dscm (0.35 dscf). Two samples of equal sampling time shall be taken at about 1-hour intervals. The arithmetic average of these 2 samples shall constitute a run For most fuel gas, sampling time exceeding 20 minutes may result in depletion of the collection solution, although fuel gases containing low concentrations of H_2S may necessitate sampling for longer periods of time.

(f) The owner or operator shall determine compliance with the SO_2 and the H_2S and reduced sulfur standards in sub. (5)(a)2 as follows:

1. Method 6 shall be used to determine the SO_2 concentration. The concentration in mg/dscm (lb/dscf) obtained by Method 6 is multiplied by 0.3754 to obtain the concentration in ppm. The sampling point in the duct shall be the centroid of the cross section if the cross-sectional area is less than 5.00 m^2 (54 ft^2) or at a point no closer to the walls than 1.00 m (39 in.) if the cross-sectional area is 5.00 m^2 or more and the centroid is more than 1 m from the wall. The sampling time and sample volume shall be at least 10 minutes and 0.010 dscm (0.35 dscf) for each sample. Eight samples of equal sampling times shall be taken at about 30-minute intervals. The arithmetic average of these 8 samples shall constitute a run. Method 4 shall be used to determine the moisture content of the gases. The sampling point for Method 4 shall be adjacent to the sampling point for Method 6. The sampling time for each sample shall be equal to the time it takes for 2 Method 6 samples. The moisture content from this sample shall be used to correct the corresponding Method 6 samples for moisture. For documenting the oxidation efficiency of the control device for reduced sulfur compound, Method 15 shall be used following the procedures of subd. 2.

2. Method 15 shall be used to determine the reduced sulfur and H_2S concentrations. Each run shall consist of 16 samples taken over a minimum of 3 hours. The sampling point shall be the same as the described for Method 6 in subd. 1. To ensure minimum residence time for the sample inside the sample lines, the sampling rate shall be at least 3.0 lpm (0.10 cfm). The SO_2 equivalent for each run shall be calculated after being corrected for moisture and oxygen as the arithmetic average of the SO_2 equivalent for each sample during the run. Method 4 shall be used to determine the moisture content of

the gases as in subd. 1. The sampling time for each sample shall be equal to the time it takes for 4 Method 15 samples.

3. The oxygen concentration used to correct the emission rate for excess air shall be obtained by the integrated sampling and analysis procedure of Method 3. The samples shall be taken simultaneously with the SO_2 reduced sulfur and H_2S, or moisture samples. The SO_2, reduced sulfur and H_2S samples shall be corrected to zero percent excess air using the equation in par. (h)3.

(g) Each performance test conducted for the purpose of determining compliance under sub. (5)(b) shall consist of all testing performed over a 7-day period using the applicable test methods and procedures specified in this subsection. To determine compliance, the arithmetic mean of the results of all the tests shall be compared with the applicable standard.

(h) For the purpose of determining compliance with sub. (5)(b)1, the following calculation procedures shall be used:

1. Calculate each 1-hour average concentration (dry, zero percent oxygen, ppmv) of sulfur dioxide at both the inlet and the outlet to the add-on control device as specified in s. NR 440.13(8). These calculations are made using the emission data collected under sub. (6)(a).

2. Calculate a 7-day average (arithmetic mean) concentration of sulfur dioxide for the inlet and for the outlet to the add-on control device using all of the 1-hour average concentration values obtained during 7 successive 24-hour periods.

3. Calculate the 7-day average percent reduction using the following equation:

$$R_{SO_2} = 100(C_{SO_2(i)} - C_{SO_2(o)})/C_{SO_2(i)}$$

where:

R_{SO_2} is the 7-day average sulfur dioxide emission reduction percent

$C_{SO_2(i)}$ is the sulfur dioxide emission concentration determined in subd. 2 at the inlet to the add-on control device, ppmv

$C_{SO_2(o)}$ is the sulfur dioxide emission concentration determined in subd. 2 at the outlet to the add-on control device, ppmv

100 is the conversion factor, decimal to percent

4. Outlet concentrations of sulfur dioxide from the add-on control device for compliance with the 50 ppmv standard, reported on a dry, O_2-free basis, shall be calculated using the procedures outlined in subds. 1 and 2, but for the outlet monitor only.

5. If supplemental sampling data are used for determining the 7-day averages under this paragraph and the data are not hourly averages, then the value obtained for each supplemental sample shall be assumed to represent the hourly average for each hour over which the sample was obtained.

6. For the purpose of adjusting pollutant concentrations to zero percent oxygen, the following equation shall be used:

$$C_{adj} = C_{meas}[20.9_c/(20.9 - \%O_2)]$$

where:

C_{adj} is the pollutant concentration adjusted to zero percent oxygen, ppm or g/dscm

C_{meas} is the pollutant concentration measured on a dry basis, ppm or g/dscm

20.9_c is the 20.9% oxygen-0.0% oxygen (defined oxygen correction basis), percent

20.9 is the oxygen concentration in air, percent

$\%O_2$ is the oxygen concentration measured on a dry basis, percent

(i) For the purpose of determining compliance with sub. (5)(b)2, the following reference methods from 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, and calculation procedures shall be used except as provided in subd. 12:

1. One 3-hour test shall be performed each day.

2. For gases released to the atmosphere from the fluid catalytic cracking unit catalyst regenerator:

a. Method 8 as modified in subd. 3 for the concentration of sulfur oxides calculated as sulfur dioxide and moisture content,

b. Method 1 for sample and velocity traverses,

c. Method 2 calculation procedures, data obtained from Methods 3 and 8, for velocity and volumetric flow rate, and

d. Method 3 for gas analysis.

3. Method 8 shall be modified by the insertion of a heated glass fiber filter between the probe and first impinger. The probe liner and glass fiber filter temperature shall be maintained above 160°C (320°F). The isopropanol impinger shall be eliminated. Sample recovery procedures described in Method 8 for container No. 1 shall be eliminated. The heated glass fiber filter also shall be excluded; however, rinsing of all connecting glassware after the heated glass fiber filter shall be retained and included in container No. 2. Sampled volume shall be at least 1 dscm.

4. For Method 3, the integrated sampling technique shall be used.

5. Sampling time for each run shall be at least 3 hours.

6. All testing shall be performed at the same location. Where the gases discharged by the fluid catalytic cracking unit catalyst regenerator pass through an incinerator-waste heat boiler in which auxiliary or supplemental gaseous, liquid or solid fossil fuel is burned, testing shall be conducted at a point between the regenerator outlet and the incinerator-waste heat boiler. An alternative sampling location after the waste heat boiler may be used if alternative coke burn-off rate equations, and, if requested, auxiliary/supplemental fuel SO_x credits, have been submitted to and approved by the department prior to sampling.

7. Coke burn-off rate shall be determined using the procedures specified under par. (b)3, unless subd. 6 applies.

8. Calculate the concentration of sulfur oxides as sulfur dioxide using equation 8-3 in Section 6.5 of Method 8 to calculate and report the total concentration of sulfur oxides as sulfur dioxide (C_{SO_x}).

9. Sulfur oxides emission rate calculated as sulfur dioxide shall be determined for each test run by the following equation:

$$E_{SO_x} = C_{SO_x} Q_{sd}/1,000$$

where:

E_{SO_x} is the sulfur oxides emission rate calculated as sulfur dioxide, kg/hr

C_{SO_x} is the sulfur oxides emission concentration calculated as sulfur dioxide, g/dscm

Q_{sd} is the dry volumetric stack gas flow rate corrected to standard conditions, dscm/hr

1,000 is the conversion factor, g to kg

10. Sulfur oxides emissions calculated as sulfur dioxide per 1,000 kg coke burn-off in the fluid catalytic cracking unit catalyst regenerator shall be determined for each test run by the following equation:

$$R_{SO_x} = (E_{SO_x}/R_c)$$

where:

R_{SO_x} is the sulfur oxides emissions calculated as sulfur dioxide, kg/1000 kg coke burn-off

E_{SO_x} is the sulfur oxides emission rate calculated as sulfur dioxide, kg/hr

R_c is the coke burn-off rate, 1,000 kg/hr

11. Calculate the 7-day average sulfur oxides emission rate as sulfur dioxide per 1,000 kg of coke burn-off by dividing the sum of the individual daily rates by the number of daily rates summed.

12. An owner or operator may, upon approval by the administrator, use an alternative method for determining compliance with sub. (5)(b)2, as provided in s. NR 440.08(2). Any requests for approval shall include data to demonstrate to the administrator that the alternative method would produce results adequate for the determination of compliance.

(j) For the purpose of determining compliance with sub. (5)(b)3, the following analytical methods and calculation procedures shall be used:

1. One fresh feed sample shall be collected once per 8-hour period.

2. Fresh feed samples shall be analyzed separately by using any one of the following applicable analytical test methods: ASTM D129-64 (reapproved 1978), ASTM D1552-83, ASTM D2622-87 or ASTM D1266-87. These methods are incorporated by reference in s. NR 440.17. The applicable range of some of these ASTM methods is not adequate to measure the levels of sulfur in some fresh feed samples. Dilution of samples prior to analysis with verification of the dilution ratio is acceptable upon prior approval of the department.

3. If a fresh feed sample cannot be collected at a single location, then the fresh feed sulfur content shall be determined as follows:

a. Individual samples shall be collected once per 8-hour period for each separate fresh feed stream charged directly into the riser or reactor of the fluid catalytic cracking unit. For each sample location the fresh feed volumetric flow rate at the time of collecting the fresh feed sample shall be measured and recorded. The same method for measuring volumetric flow rate shall be used at all locations.

b. Each fresh feed sample shall be analyzed separately using the methods specified under subd. 2.

c. Fresh feed sulfur content shall be calculated for each 8-hour period using the following equation:

$$S_f = \sum_{i=1}^{n} \frac{S_i Q_i}{Q_f}$$

where:

S_f is the fresh feed sulfur content expressed in percent by weight of fresh feed

n is the number of separate fresh feed streams charged directly to the riser or reactor of the fluid catalytic cracking unit

Q_f is the total volumetric flow rate of fresh feed charged to the fluid catalytic cracking unit

S_i is the fresh feed sulfur content expressed in percent by weight of fresh feed for the "ith" sampling location

Q_i is the volumetric flow rate of fresh feed stream for the "ith" sampling location

4. Calculate a 7-day average (arithmetic mean) sulfur content of the fresh feed using all of the fresh feed sulfur content values obtained during 7 successive 24-hour periods.

SECTION 76. NR 440.26(8) and (9) are created to read:

NR 440.26(8) REPORTING AND RECORDKEEPING REQUIREMENTS. (a) Each owner or operator subject to sub. (5)(b) shall notify the department of the specific provisions of sub. (5)(b) with which the owner or operator elects to comply. Notification shall be submitted with the notification of initial startup required by s. NR 440.07(1)(c). If an owner or operator elects at a later date to comply with an alternative provision of sub. (5)(b), then the department shall be notified by the owner or operator in the quarterly, or semiannual, report described in pars. (c) and (d) for the quarter during which the change occurred.

(b) Each owner or operator subject to sub. (5)(b) shall record and maintain the following information:

1. If complying with sub. (5)(b)1:

a. All data and calibrations from continuous monitoring systems located at the inlet and outlet to the control device, including the results of the daily drift tests and quarterly accuracy assessments required under Appendix F, Procedure 1 of 40 CFR part 60, incorporated by reference in s. NR 440.17;

b. Measurements obtained by supplemental sampling required under subs. (6)(a)13. and (7)(k) for meeting minimum data requirements; and

c. The written procedures for the quality control program required by Appendix F, Procedure 1 of 40 CFR part 60, incorporated by reference in s. NR 440.17.

2. If complying with sub. (5)(b)2, measurements obtained in the daily Method 8 testing, or those obtained by alternative measurement methods, if sub. (7)(i)12 applies.

3. If complying with sub. (5)(b)3, data obtained from the daily feed sulfur tests.

4. Each 7-day rolling average compliance determination.

(c) Each owner or operator subject to sub. (5)(b) shall submit a report each quarter except as provided by par. (d). The following information shall be contained in each quarterly report:

1. Any 7-day period during which:

a. The average percent reduction and average concentration of sulfur dioxide on a dry, O_2 -free basis in the gases discharged to the atmosphere from any fluid cracking unit catalyst regenerator for which the owner or operator seeks to comply with sub. (5)(b)1 is below 90% and above 50 ppmv, as measured by the continuous monitoring system prescribed under sub. (6)(a)8, or above 50 ppmv, as measured by the outlet continuous monitoring system prescribed under sub. (6)(a)9. The average percent reduction and average sulfur dioxide concentration shall be determined using the procedures specified under sub. (7)(h);

b. The average emission rate of sulfur dioxide in the gases discharged to the atmosphere from any fluid catalytic cracking unit catalyst regenerator for which the owner or operator seeks to comply with sub. (5)(b)2 exceeds 9.8 kg SO_x per 1,000 kg coke burn-off, as measured by the daily testing prescribed under sub. (7)(i). The average emission rate shall be determined using the procedures specified under sub. (7)(i); and

c. The average sulfur content of the fresh feed for which the owner or operator seeks to comply with sub. (5)(b)3 exceeds 0.30% by weight. The fresh feed sulfur content, a 7-day rolling average, shall be determined using the procedures specified under sub. (7)(j).

2. Any 30-day period in which the minimum data requirements specified in sub. (5)(d) are not obtained.

3. For each 7-day period during which an exceedance has occurred as defined in par. (c)1 a to c and 2:

a. The date that the exceedance occurred;

b. An explanation of the exceedance;

c. Whether the exceedance was concurrent with a startup, shutdown or malfunction of the fluid catalytic cracking unit or control system; and

d. A description of the corrective action taken, if any.

4. If subject to sub. (5)(b)1:

a. The dates for which and brief explanations as to why fewer than 18 valid hours of data were obtained for the inlet continuous monitoring system;

b. The dates for which and brief explanations as to why fewer than 18 valid hours of data were obtained for the outlet continuous monitoring system;

c. Identification of times when hourly averages have been obtained based on manual sampling methods;

d. Identification of the times when the pollutant concentration exceeded the full span of the continuous monitoring system;

e. Description of any modifications to the continuous monitoring system that could affect the ability of the continuous monitoring system to comply with Performance Specification 2 or 3 of 40 CFR part 60, Appendix B, incorporated by reference in s. NR 440.17; and

f. Results of daily drift tests and quarterly accuracy assessments as required under Appendix F, Procedure 1 of 40 CFR part 60, incorporated by reference in s. NR 440.17.

5. If subject to sub. (5)(b)2, for each day in which a Method 8 sample result was not obtained, the date for which and brief explanation as to why a Method 8 sample result was not obtained, for approval by the department.

6. If subject to sub. (5)(b)3, for each 8-hour shift in which a feed sulfur measurement was not obtained, the date for which and brief explanation as to why a feed sulfur measurement was not obtained, for approval by the department.

(d) If no exceedances, as defined in par. (c)1 a to c and 2, occur in a quarter, and if the owner or operator has not changed the standard under sub. (5)(b) under which compliance is obtained, then the owner or operator may submit a semiannual report in which a statement is included that states that no exceedances had occurred during the affected quarter or quarters. If the owner or operator elects to comply with an alternative provision of sub. (5)(b), a quarterly report shall be submitted for the quarter during which a change occurred.

(e) For any periods for which sulfur dioxide or oxides emissions data are not available, the owner or operator of the affected facility shall submit a signed statement indicating if any changes were made in operation of the emission control system during the period of data unavailability which could affect the ability of the system to meet the applicable emission limit. Operations of the control system and affected facility during periods of data unavailability shall be compared with operation of the control system and affected facility before and following the period of data unavailability.

(f) The owner or operator of the affected facility shall submit a signed statement certifying the accuracy and completeness of the information contained in the report.

(9) PERFORMANCE TEST AND COMPLIANCE PROVISIONS. (a) Section NR 440.08(4) shall apply to the initial performance test specified under par. (c), but not to the daily performance tests required thereafter as specified in par. (d). Section NR 440.08(6) does not apply when determining compliance with the standards specified under sub. (5)(d). Section NR 440.08(6) does not apply when determining compliance with the standards specified under sub. (5)(b). Performance tests conducted for the purpose of determining compliance under sub. (5)(b) shall be conducted according to the applicable procedures specified under sub. (7).

(b) Owners or operators who seek to comply with sub. (5)(b)3 shall meet that standard at all times, including periods of startup, shutdown and malfunctions.

(c) The initial performance test shall consist of the initial 7-day average calculated for compliance with sub. (5)(b)1, 2 or 3.

(d) After conducting the initial performance test prescribed under s. NR 440.08, the owner or operator of a~~n~~ fluid catalytic cracking unit catalyst regenerator subject to sub. (5)(b) shall conduct a performance test for each successive 24-hour period thereafter. The daily performance tests shall be conducted according to the appropriate procedures specified under sub. (7). In the event that a sample collected under sub. (7)(i) or (j) is accidentally lost or conditions occur in which one of the samples is discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions or other circumstances beyond the owner or operators' control, compliance may be determined using available data for the 7-day period.

(e) Each owner or operator subject to sub. (5)(b) who has demonstrated compliance with one of the provisions of sub. (5)(b) but at a later date seeks to comply with another of the provisions of sub. (5)(b) shall begin conducting daily performance tests as specified under par. (d) immediately upon electing to become subject to one of the other provisions of sub. (5)(b). The owner or operator shall furnish the department a written notification of the change in a quarterly report that shall be submitted for the quarter in which the change occurred.

SECTION 77. NR 440.27(2)(k) and (4)(b) are amended to read:

NR 440.27(2)(k) "True vapor pressure" means the equilibrium partial pressure exerted by a petroleum liquid as determined in accordance with methods described in American Petroleum Institute ~~Bulletin~~ Publication 2517, Evaporation Loss from External Floating Roof Tanks, Second Edition, February 1980, incorporated by reference in s. NR 440.17.

(4)(b) Available data on the typical Reid vapor pressure and the maximum expected storage temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API ~~Bulletin~~ Publication 2517, incorporated by reference in s. NR 440.17, unless the department specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from one or more samples.

SECTION 78. NR 440.28(2)(j) and (6)(b) are amended to read:

NR 440.28(2)(j) "True vapor pressure" means the equilibrium partial pressure exerted by a petroleum liquid such as determined in accordance with methods described in American Petroleum Institute ~~Bulletin~~ Publication 2517, Evaporation Loss from External Floating Roof Tanks, Second Edition, February 1980, incorporated by reference in s. NR 440.17.

(6)(b) Available data on the typical Reid vapor pressure and the maximum expected storage temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API ~~Bulletin~~ Publication 2517, incorporated by reference in s. NR 440.17, unless the department specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from samples.

SECTION 79. NR 440.285(1)(c) and (2)(f)(intro.) and (4)(a)4. are amended to read:

NR 440.285(1)(c) Except as specified in sub. (7)~~(b)~~(a) and ~~(c)~~(b), vessels either with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor less than 3.5 kPa or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa are exempt from ss. NR 440.01 to 440.18 and from the provisions of this section.

(2)(f)(intro.) "Maximum true vapor pressure" means the equilibrium partial pressure exerted by the stored ~~liquid~~ VOL at the temperature equal to the highest calendar-month average of the ~~liquid~~ VOL storage temperature for ~~liquids~~ VOLs stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the national weather service for ~~liquids~~ VOLs stored at the ambient temperature, as determined:

(4)(a)4. Visually inspect the internal floating roof, the primary seal, the secondary seal (if one is in service), gaskets, slotted membranes (if any), and sleeve seals (if any) each time the storage vessel is emptied and degassed. If the internal floating roof has defects, the primary seal has holes, tears~~,~~ or other openings in the seal or the seal fabric, the secondary seal has holes, tears~~,~~ or other openings in the seal or the seal fabric, the gaskets no longer close off the liquid surfaces from the atmosphere, or the slotted membrane has more than 10% open area, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before refilling the storage vessel with VOL. In no event may inspections conducted in accordance with this provision occur at intervals greater than 10 years in the case of vessels undergoing annual visual inspections as specified in ~~subd.~~ subds. 2 ~~or~~ and 3 b nor at intervals greater than 5 years in the case of vessels specified in subd. 3 a.

SECTION 80. NR 440.29(4) is repealed and recreated to read:

NR 440.29(4) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. Method 5 shall be used to determine the particulate matter concentration during representative periods of furnace operation, including charging and tapping. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf).

2. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 81. NR 440.30(4) is repealed and recreated to read:

NR 440.30(4) TEST METHODS AND PROCEDURES. (a) In conducting performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. Method 5 shall be used to determine the particulate matter concentration during representative periods of charging and refining, but not during pouring of the heat. The sampling time and sample volume for each run shall be at least 120 minutes and 1.80 dscm (63.6 dscf).

2. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 82. NR 440.31(4)(b)5. is amended to read:

NR 440.31(4)(b)5. All monitoring devices shall be recalibrated annually, and at other times as the department may require, in accordance with the procedures under s. NR 440.13(2)~~(e)~~.

SECTION 83. NR 440.31(5) is repealed and recreated to read:

NR 440.31(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. The time-measuring instrument of sub. (4) shall be used to document the time and duration of each steel production cycle and each diversion period during each run.

2. Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 1.50 dscm (53 dscf). Sampling shall be discontinued during periods of diversions.

a. For affected facilities that commenced construction, modification or reconstruction on or before January 20, 1983, the sampling for each run shall continue for an integral number of steel production cycles. A cycle shall start at the beginning of either the scrap preheat or the oxygen blow and shall terminate immediately before tapping.

b. For affected facilities that commenced construction, modification or reconstruction after January 20, 1983, the sampling for each run shall continue for an integral number of primary oxygen blows.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity. Observations taken during a diversion period may not be used in determining compliance with the opacity standard. Opacity observations taken at 15-second intervals immediately before and after a diversion of exhaust gases from the stack may be considered to be consecutive for the purpose of computing an average opacity for a 6-minute period.

(c) To comply with sub. (4)(c), the owner or operator shall use the monitoring devices of sub. (4)(b)1 and 2 during the particulate runs to determine the 3-hour averages of the required measurements.

SECTION 84. NR 440.315(5) is repealed and recreated to read:

NR 440.315(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part

60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standard in sub. (3) as follows:

1. Start and end times of each steel production cycle during each run shall be recorded.

Note: See sub. (6)(c) and (d) for the definitions of start and end times of a cycle.

2. Method 5 shall be used to determine the particulate matter concentration. Sampling shall be conducted only during the steel production cycle and for a sufficient number of steel production cycles to obtain a total sample volume of at least 5.67 dscm (200 dscf) for each run.

3. Method 9 and the procedures of s. NR 440.11 shall be used to determine opacity, except sections 2.4 and 2.5 of Method 9 shall be replaced with the following instructions for recording observations and reducing data.

a. Section 2.4. Opacity observations shall be recorded to the nearest 5% at 15-second intervals. During the initial performance test conducted pursuant to s. NR 440.08, observations shall be made and recorded in this manner for a minimum of 3 steel production cycles. During any subsequent compliance test, observations may be made for any number of steel production cycles, although, where conditions permit, observations will generally be made for a minimum of 3 steel production cycles.

b. Section 2.5. Opacity shall be determined as an average of 12 consecutive observations recorded at 15-second intervals. For each steel production cycle, divide the observations recorded into sets of 12 consecutive observations. Sets need not be consecutive in time, and in no case may 2 sets overlap. For each set of 12 observations, calculate the average by summing the opacity of 12 consecutive observations and dividing this sum by 12.

(c) In complying with the requirements of sub. (4)(c), the owner or operator shall conduct an initial test as follows:

1. For devices that monitor and record the exhaust ventilation rate, compare velocity readings recorded by the monitoring device against the velocity readings obtained by Method 2. Take Method 2 readings at a point or points that would properly characterize the monitoring device's performance and that would adequately reflect the various rates of exhaust ventilation. Obtain readings at sufficient intervals to obtain 12 pairs of readings for

each duct of the secondary emission capture system. Compare the averages of the 2 sets to determine whether the monitoring device velocity is within ±10% of the Method 2 average.

2. For devices that monitor the level of exhaust ventilation and record only step changes when a set point rate is reached, compare step changes recorded by the monitoring device against the velocity readings obtained by Method 2. Take Method 2 readings at a point or points that would properly characterize the performance of the monitoring device and that would adequately reflect the various rates of exhaust ventilation. Obtain readings at sufficient intervals to obtain 12 pairs of readings for each duct of the secondary emission capture system. Compare the averages of the 2 sets to determine whether the monitoring device step change is within ±10% of the setpoint rate.

(d) To comply with sub. (4)(d) or (e), the owner or operator shall use the monitoring device of sub. (4)(a) to determine the exhaust ventilation rates or levels during the particulate matter runs and to determine a 3-hour average.

SECTION 85. NR 440.32(4)(a)1. is amended to read:

NR 440.32(4)(a)1. Install, calibrate, maintain, and operate a flow measuring device which can be used to determine either the mass or volume of sludge charged to the incinerator. The flow measuring device shall ~~have an accuracy of plus or minus 5% over its operating range~~ be certified by the manufacturer to have an accuracy of ±5% over its operating range. Except as provided in par. (d), the flow measuring device shall be operated continuously and data recorded during all periods of operation of the incinerator.

SECTION 86. NR 440.32(4)(b) to (e) are created to read:

NR 440.32(4)(b) The owner or operator of any multiple hearth, fluidized bed or electric sludge incinerator subject to the provisions of this section shall comply with the requirements of par. (a) and:

1. For incinerators equipped with a wet scrubbing device, install calibrate, maintain and operate a monitoring device that continuously measures and records the pressure drop of the gas flow through the wet scrubbing device. Where a combination of wet scrubbers is used in series, the pressure drop of the gas flow through the combined system shall be continuously monitored. The device used to monitor scrubber pressure drop shall be

certified by the manufacturer to be accurate within ±250 pascal (±1 inch water gauge) and shall be calibrated on an annual basis in accordance with the manufacturer's instructions.

2. Install, calibrate, maintain and operate a monitoring device that continuously measures and records the oxygen content of the incinerator exhaust gas. The oxygen monitoring shall be located upstream of any rabble shaft cooling air inlet into the incinerator exhaust gas stream, fan, ambient air recirculation damper, or any other source of dilution air. The oxygen monitoring device shall be certified by the manufacturer to have a relative accuracy of ±5% over its operating range and shall be calibrated according to method or methods prescribed by the manufacturer at least once each 24-hour operating period.

3. Install, calibrate, maintain and operate temperature measuring devices at every hearth in multiple hearth furnaces; in the bed and outlet of fluidized bed incinerators; and in the drying, combustion and cooling zones of electric incinerators. For multiple hearth furnaces, a minimum of one thermocouple shall be installed in each hearth in the cooling and drying zones, and a minimum of 2 thermocouples shall be installed in each hearth in the combustion zone. For electric incinerators, a minimum of one thermocouple shall be installed in the drying zone and one in the cooling zone, and a minimum of 2 thermocouples shall be installed in the combustion zone. Each temperature measuring device shall be certified by the manufacturer to have an accuracy of ±5% over its operating range. Except as provided in par. (d), the temperature monitoring devices shall be operated continuously and data recorded during all periods of operation of the incinerator.

4. Install, calibrate, maintain and operate a device for measuring the fuel flow to the incinerator. The flow measuring device shall be certified by the manufacturer to have an accuracy of ±5% over its operating range. Except as provided in par. (d), the fuel flow measuring device shall be operated continuously and data recorded during all periods of operation of the incinerator.

5. Except as provided in par. (d), collect and analyze a grab sample of the sludge fed to the incinerator once per day. The dry sludge content and the volatile solids content of the sample shall be determined in accordance with the method specified under sub. (5)(b)5, except that the determination of volatile solids, step 3.b. of the method, may not be deleted.

(c) The owner or operator of any multiple hearth, fluidized bed or electric sludge incinerator subject to the provisions of this section shall retain the following information and make it available for inspection by the department for a minimum of 2 years:

1. For incinerators equipped with a wet scrubbing device, a record of the measured pressure drop of the gas flow through the wet scrubbing device, as required by par. (b)1.

2. A record of the measured oxygen content of the incinerator exhaust gas, as required by par. (b)2.

3. A record of the rate of sludge charged to the incinerator, the measured temperatures of the incinerator, the fuel flow to the incinerator, and the total solids and volatile solids content of the sludge charged to the incinerator, as required by pars. (a)1 and (b)3, 4 and 5.

(d) The owner or operator of any multiple hearth, fluidized bed, or electric sludge incinerator subject to the provisions of this section from which the particulate matter emission rate measured during the performance test required under sub. (5)(d) is less than or equal to 0.38 g/kg of dry sludge input (0.75 lb/ton) shall be required to comply with the requirements in pars. (a) to (c) during all periods of operation of this incinerator following the performance test except that:

1. Continuous operation of the monitoring devices and data recorders in pars. (a)1 and (b)3 and 4 is not required.

2. Daily sampling and analysis of sludge feed in par. (b)5 is not required.

3. Recordkeeping specified in par. (c)3 is not required.

(e) The owner or operator of any sludge incinerator other than a multiple hearth, fluidized bed or electric incinerator or any sludge incinerator equipped with a control device other than a wet scrubber shall submit to the administrator for approval a plan for monitoring and recording incinerator and control device operation parameters. The plan shall be submitted to the administrator:

1. No later than 90 days after October 6, 1988, for sources which have provided notification of commencement of construction prior to October 6, 1988.

2. No later than 90 days after the notification of commencement of construction, for sources which provide notification of commencement of construction on or after October 6, 1988.

3. At least 90 days prior to the date on which the new control device becomes operative, for sources switching to a control device other than a wet scrubber.

SECTION 87. NR 440.32(5) is repealed and recreated to read:

NR 440.32(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60 and Appendix B of 40 CFR part 61, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter emission standards in sub. (3) as follows:

1. The emission rate (E) of particulate matter for each run shall be computed using the following equation:

$$E = K(c_s\ Q_{sd})/S$$

where:

E is the emission rate of particulate matter, g/kg (lb/ton) of dry sludge input

c_s is the concentration of particulate matter, g/dscm (g/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

S is the charging rate of dry sludge during the run, kg/hr (lb/hr)

K is the conversion factor, 1.0 g/g [4.409 lb^2/g-ton)]

2. Method 5 shall be used to determine the particulate matter concentration (c_s) and the volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf).

3. The dry sludge charging rate (S) for each run shall be computed using either of the following equations:

$$S = K_m\ S_m\ R_{dm}/\Theta$$

$$S = K_v\ S_v\ R_{dv}/\Theta$$

where:

S is the charging rate of dry sludge, kg/hr (lb/hr)

S_m is the total mass of sludge charged, kg (lb)

R_{dm} is the average mass of dry sludge per unit mass of sludge charged, mg/mg (lb/lb)

θ is the duration of run, min

K_m is the conversion factor, 60 min/hr

S_v is the total volume of sludge charged, m^3 (gal)

R_{dv} is the average mass of dry sludge per unit volume of sludge charged, mg/liter (lb/ft^3)

K_v is the conversion factor, 60×10^{-3} (liter-kg-min)/(m^3-mg-hr)[8.021 (ft^3-min)/(gal-hr)]

4. The flow measuring device described in sub. (4)(a)1 shall be used to determine the total mass (S_m) or volume (S_v) of sludge charged to the incinerator during each run. If the flow measuring device is on a time rate basis, readings shall be taken and recorded at 5-minute intervals during the run and the total charge of sludge shall be computed using the following equations, as applicable:

$$S_m = \sum_{i=1}^{n} Q_{mi}/\theta_i$$

$$S_v = \sum_{i=1}^{n} Q_{vi}/\theta_i$$

where:

Q_{mi} is the average mass flow rate calculated by averaging the flow rates at the beginning and end of each interval "i", kg/min (lb/min)

Q_{vi} is the average volume flow rate calculated by averaging the flow rates at the beginning and end of each interval "i", m^3/min (gal/min)

θ_i is the duration of interval "i", min

5. Samples of the sludge charged to the incinerator shall be collected in nonporous jars at the beginning of each run and at approximately 1-hour

intervals thereafter until the test ends, and Method 2540 G., "Total, Fixed, and Volatile Solids in Solid and Semisolid Samples", in Standard Methods for the Examination of Water and Wastewater, 17th edition, 1989, incorporated by reference in s. NR 440.17, shall be used to determine dry sludge content of each sample (total solids residue), except that:

a. Evaporating dishes shall be ignited to at least 103°C rather than the 550°C specified in step 3.a.1).

b. Determination of volatile solids, step 3.b., may be deleted.

c. The quantity of dry sludge per unit sludge charged shall be determined in terms of mg/liter (lb/ft^3) or mg/mg (lb/lb).

d. The average dry sludge content shall be the arithmetic average of all the samples taken during the run.

6. Method 9 and the procedures described in s. NR 440.11 shall be used to determine opacity.

(d) The owner or operator of any sludge incinerator subject to the provisions of this section shall conduct a performance test during which the monitoring and recording devices required under sub. (4)(a)1 and (b)1 to 4, are installed and operating and for which the sampling and analysis procedures required under sub. (4)(b)5 are performed. The owner or operator shall provide the department at least 30 days prior notice of the performance test to afford the department the opportunity to have an observer present.

1. For incinerators that commenced construction or modification on or before April 18, 1986, the performance test shall be conducted by October 1, 1989 unless the monitoring and recording devices required under sub. (4)(a)1 and (b)1 to 4 were installed and operating and the sampling and analysis procedures required under sub. (4)(b)5 were performed during the most recent performance test and a record of the measurements taken during the performance test is available.

2. For incinerators that commence instruction or modification after April 18, 1986, the date of the performance test shall be determined by the requirements in s. NR 440.08.

3. For the initial performance test required by this paragraph, the 3 samples collected by Method 5, shall be analyzed first for particulate mass and then in one of the following 2 ways:

a. Two samples shall be analyzed by neutron activation for arsenic, cadmium, chromium, copper, nickel, selenium and zinc; and one sample shall be analyzed by atomic absorption for beryllium and lead. The sample analyzed for beryllium and lead shall be analyzed according to Method 104 and Method 12, respectively.

b. Three samples shall be analyzed by atomic absorption for arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium and zinc. The samples shall be analyzed for arsenic, beryllium and lead according to Method 108, Method 104 and Method 12, respectively. The samples shall be analyzed for cadmium, chromium, copper, nickel, selenium and zinc according to standard analytical procedures as recommended by atomic absorption equipment manufacturers.

4. During the initial performance test required by this paragraph, sludge samples shall be collected for the purpose of determining the metals content of the sludge. Samples shall be collected from the sludge charged to the incinerator at the beginning of each run and at approximately 30 minute intervals thereafter until the test run ends. The sludge samples collected during each test run shall be combined into a single composite sample. During the performance test, 3 composite samples shall be generated. The composite samples shall be analyzed in one of the following 2 ways:

a. The composite samples shall be analyzed for arsenic, cadmium, chromium, copper, nickel, selenium and zinc by neutron activation procedures, and for beryllium and lead by atomic absorption according to Method 104 and Method 12, respectively.

b. The composite samples shall be analyzed by atomic absorption for arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium and zinc. The samples shall be analyzed for arsenic, beryllium and lead according to Method 108, Method 104 and Method 12 respectively. These samples shall be analyzed for cadmium, chromium, copper, nickel, selenium and zinc according to standard analytical procedures as recommended by atomic absorption equipment manufacturers.

5. The requirements of subds. 3 and 4 shall apply only during the first performance test required pursuant to this chapter.

SECTION 88. NR 440.32(6) is created to read:

NR 440.32(6) REPORTING. (a) The owner or operator of any multiple hearth, fluidized bed or electric sludge incinerator subject to the provisions of this section shall submit to the department semiannually a report in writing which contains the following:

1. A record of average scrubber pressure drop measurements for each period of 15 minute duration or more during which the pressure drop of the scrubber was less than, by a percentage specified in subpar. a or b, as applicable, the average scrubber pressure drop measured during the most recent performance test. The percent reduction in scrubber pressure drop for which a report is required shall be determined as follows:

a. For incinerators that achieved an average particulate matter emission rate of 0.38 kg/Mg (0.75 lb/ton) dry sludge input or less during the most recent performance test, a scrubber pressure drop reduction of more than 30% from the average scrubber pressure drop recorded during the most recent performance test shall be reported.

b. For incinerators that achieved an average particulate matter emission rate of greater than 0.38 kg/Mg (0.75 lb/ton) dry sludge input during the most recent performance test, a percent reduction in pressure drop greater than that calculated according to the following equation shall be reported:

$$P = -111E + 72.15$$

where:

P is the percent reduction in pressure drop, and

E is the average particulate matter emissions (kg/megagram)

2. A record of average oxygen content in the incinerator exhaust gas for each period of 1-hour duration or more that the oxygen content of the incinerator exhaust gas exceeds the average oxygen content measured during the most recent performance test by more than 3%.

(b) The owner or operator of any multiple hearth, fluidized bed or electric sludge incinerator from which the average particulate matter emission rate measured during the performance test required under sub. (5)(d) exceeds 0.38 g/kg of dry sludge input (0.75 lb/ton of dry sludge input) shall include in the report for each calendar day that a decrease in scrubber pressure drop or increase in oxygen content of exhaust gas is reported a record of the following:

1. Scrubber pressure drop averaged over each 1-hour incinerator operating period.

2. Oxygen content in the incinerator exhaust averaged over each 1-hour incinerator operating period.

3. Temperatures of every hearth in multiple hearth incinerators; of the bed and outlet of fluidized bed incinerators; and of the drying, combustion and cooling zones of electric incinerators averaged over each 1-hour incinerator operating period.

4. Rate of sludge charged to the incinerator averaged over each 1-hour incinerator operating period.

5. Incinerator fuel use averaged over each 8-hour incinerator operating period.

6. Moisture and volatile solids content of the daily grab sample of sludge charged to the incinerator.

(c) The owner or operator of any sludge incinerator other than a multiple hearth, fluidized bed or electric incinerator or any sludge incinerator equipped with a control device other than a wet scrubber shall include in the semiannual report a record of control device operation measurements, as specified in the plan approved under sub. (4)(e).

SECTION 89. NR 440.33(6)(b)2.a. and b. are amended to read:

NR 440.33(6)(b)2.a. The continuous monitoring system performance evaluation required under s. NR 440.13(3) shall be completed prior to the initial performance test required under s. NR 440.08. ~~During the performance evaluation, the span of the continuous monitoring system may be set at a sulfur dioxide concentration of 0.15% by volume if necessary to maintain the system output between 20% and 90% of full scale. Upon completion of the continuous monitoring system performance evaluation, the span of the continuous monitoring system shall be set at a sulfur dioxide concentration of 0.20% by volume.~~

b. For the purpose of the continuous monitoring system performance evaluation required under s. NR 440.13(3), the reference method referred to under the ~~Field Test for Accuracy (Relative)~~ Relative Accuracy Test Procedure in Performance Specification 2 of 40 CFR ~~pt.~~ part 60, Appendix B, incorporated by reference in s. NR 440.17, shall be ~~Reference~~ Method 6 of 40 CFR ~~pt.~~ part 60, Appendix A, incorporated by reference in s. NR 440.17. For the performance evaluation, each concentration measurement shall be of one hour duration. The pollutant gas used to prepare the calibration gas mixtures required under Performance Specification 2 of Appendix B and for calibration checks under s. NR 440.13(4) shall be sulfur dioxide.

SECTION 90. NR 440.33(7) is repealed and recreated to read:

NR 440.33(7) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter, sulfur dioxide (SO_2) and visible emission standards in subs. (3) to (5) as follows:

1. Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

2. The continuous monitoring system of sub. (6)(b)2 shall be used to determine the SO_2 concentrations on a dry basis. The sampling time for each run shall be 6 hours, and the average SO_2 concentration shall be computed for the 6-hour period as in sub. (6)(c). The monitoring system drift during the run may not exceed 2% of the span value.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 91. NR 440.34(6)(a)2.a. and b. are amended to read:

NR 440.34(6)(a)2.a. The continuous monitoring system performance evaluation required under s. NR 440.13(3) shall be completed prior to the initial performance test required under s. NR 440.08. ~~During the performance evaluation, the span of the continuous monitoring system may be set at a sulfur dioxide concentration of 0.15% by volume if necessary to maintain the system output between 20% and 90% of full scale. Upon completion of the continuous monitoring system performance evaluation, the span of the continuous monitoring system shall be set at a sulfur dioxide concentration of 0.20% by volume.~~

b. For the purpose of the continuous monitoring system performance evaluation required under s. NR 440.13(3), the reference method referred to under the ~~Field Test for Accuracy (Relative)~~ Relative Accuracy Test Procedure in Performance Specification 2 of 40 CFR ~~pt.~~ part 60, Appendix B, incorporated by reference in s. NR 440.17, shall be ~~Reference~~ Method 6 of 40 CFR pt. 60, Appendix A, incorporated by reference in s. NR 440.17. For the performance evaluation, each concentration measurement shall be of one hour duration. The pollutant gas used to prepare the calibration gas mixtures required under Performance Specification 2 of Appendix B and for calibration checks under s. NR 440.13(4) shall be sulfur dioxide.

SECTION 92. NR 440.34(7) is repealed and recreated to read:

NR 440.34(7) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter, sulfur dioxide (SO_2) and visible emission standards in subs. (3) to (5) as follows:

1. Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

2. The continuous monitoring system of sub. (6)(a)2 shall be used to determine the SO_2 concentrations on a dry basis. The sampling time for each run shall be 2 hours, and the average SO_2 concentration for the 2-hour period shall be computed as in sub. (6)(b). The monitoring system drift during the run may not exceed 2% of the span value.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 93. NR 440.35(6)(a)2.a. and b. are amended to read:

NR 440.35(6)(a)2.a. The continuous monitoring system performance evaluation required under s. NR 440.13(3) shall be completed prior to the initial performance test required under s. NR 440.08. ~~During the performance evaluation, the span of the continuous monitoring system may be set at a sulfur dioxide concentration of 0.15% by volume if necessary to maintain the system output between 20% and 90% of full scale. Upon completion of the continuous monitoring system performance evaluation, the span of the continuous monitoring system shall be set at a sulfur dioxide concentration of 0.20% by volume.~~

b. For the purpose of the continuous monitoring system performance evaluation required under s. NR 440.13(3), the reference method referred to under the ~~Field Test for Accuracy (Relative)~~ Relative Accuracy Test Procedure in Performance Specification 2 of 40 CFR ~~pt.~~ part 60, Appendix B, incorporated by reference in s. NR 440.17, shall be ~~Reference~~ Method 6 of 40 CFR ~~pt.~~ part 60, Appendix A, incorporated by reference in s. NR 440.17. For the performance evaluation, each concentration measurement shall be of one hour duration. The pollutant gas used to prepare the calibration gas mixtures required under Performance Specification 2 of Appendix B and for calibration checks under s. NR 440.13(4) shall be sulfur dioxide.

SECTION 94. NR 440.35(7) is repealed and recreated to read:

NR 440.35(7) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter, sulfur dioxide (SO_2) and visible emission standards in subs. (3) to (5) as follows:

1. Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

2. The continuous monitoring system of sub. (6)(a)2 shall be used to determine the SO_2 concentrations on a dry basis. The sampling time for each run shall be 2 hours, and the average SO_2 concentration for the 2-hour period shall be computed as in sub. (6)(b). The monitoring system drift during the run may not exceed 2% of the span value.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 95. NR 440.36(6)(a) and Note are renumbered NR 440.36(5)(c) and Note.

SECTION 96. NR 440.36(6)(a) and (b) are created to read:

NR 440.36(6)(a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in

s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the total fluorides and visible emission standards in subs. (3) and (4) as follows:

1. The emission rate (E_p) of total fluorides from potroom groups shall be computed for each run using the following equation:

$$E_p = [(C_s Q_{sd})_1 + (C_s Q_{sd})_2]/(PK)$$

where:

E_p is the emission rate of total fluorides from a potroom group, kg/Mg (lb/ton)

C_s is the concentration of total fluorides, mg/dscm (mg/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P is the aluminum production rate, Mg/hr (ton/hr)

K is the conversion factor, 10^6 mg/kg (453,600 mg/lb)

1 is the subscript for primary control system effluent gas

2 is the subscript for secondary control system or roof monitor effluent gas

2. The emission rate (E_b) of total fluorides from anode bake plants shall be computed for each run using the following equation:

$$E_b = (C_s Q_{sd})/(P_e K)$$

where:

E_b is the emission rate of total fluorides, kg/Mg (lb/ton) of aluminum equivalent

C_s is the concentration of total fluorides, mg/dscm (mg/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P_e is the aluminum equivalent for anode production rate, Mg/hr (ton/hr)

K is the conversion factor, 10^6 mg/kg (453,600 mg/lb)

3. Method 13A or 13B shall be used for ducts or stacks and Method 14 for roof monitors not employing stacks or pollutant collection systems, to determine the total fluorides concentration (C_s) and volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run

shall be at least 8 hours and 6.80 dscm (240 dscf) for potroom groups and at least 4 hours and 3.40 dscm (120 dscf) for anode bake plants.

4. The monitoring devices of sub. (5)(a) shall be used to determine the daily weight of aluminum and anode produced.

a. The aluminum production rate (P) shall be determined by dividing 720 hours into the weight of aluminum tapped from the affected facility during a period of 30 days before and including the final run of a performance test.

b. The aluminum equivalent production rate (P_e) for anodes shall be determined as 2 times the average weight of anode produced during a representative oven cycle divided by the cycle time. An owner or operator may establish a multiplication factor other than 2 by submitting production records of the amount of aluminum produced and the concurrent weight of anodes consumed by the potrooms.

5. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 97. NR 440.36(6)(c) to (i) are repealed.

SECTION 98. NR 440.37(4)(b) is amended to read:

NR 440.37(4)(b) The owner or operator of any wet-process phosphoric acid plant shall maintain a daily record of equivalent P_2O_5 feed by first determining the total mass rate in metric ton/hr of phosphorus bearing feed using a monitoring device for measuring mass flow rate which meets the requirements of par. (a) and then by proceeding according to sub. ~~(5)(d)2~~ (5)(b)3.

SECTION 99. NR 440.37(5) is repealed and recreated to read:

NR 440.37(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the total fluorides standard in sub. (3) as follows:

1. The emission rate (E) of total fluorides shall be computed for each run using the following equation:

$$E = \left(\sum_{i=1}^{N} C_{si}\, Q_{sdi}\right)/(PK)$$

where:

E is the emission rate of total fluorides, g/metric ton (lb/ton) of equivalent P_2O_5 feed

C_{si} is the concentration of total fluorides from emission point "i", mg/dscm (mg/dscf)

Q_{sdi} is the volumetric flow rate of effluent gas from emission point "i", dscm/hr (dscf/hr)

N is the number of emission points associated with the affected facility

P is the equivalent P_2O_5 feed rate, metric ton/hr (ton/hr)

K is the conversion factor, 1000 mg/g (453,600 mg/lb)

2. Method 13A or 13B shall be used to determine the total fluorides concentration (C_{si}) and volumetric flow rate (Q_{sdi}) of the effluent gas from each of the emission points. The sampling shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The equivalent P_2O_5 feed rate (P) shall be computed for each run using the following equation:

$$P = M_p\, R_p$$

where:

M_p is the total mass flow rate of phosphorus-bearing feed, metric ton/hr (ton/hr)

R_p is the P_2O_5 content, decimal fraction

a. The accountability system of sub. (4)(a) shall be used to determine the mass flow rate (M_p) of the phosphorus-bearing feed.

b. The Association of Official Analytical Chemists (AOAC) Method 9, incorporated by reference in s. NR 440.17, shall be used to determine the P_2O_5 content (R_p) of the feed.

SECTION 100. NR 440.38(4)(b) is amended to read:

NR 440.38(4)(b) The owner or operator of any superphosphoric acid plant shall maintain a daily record of equivalent P_2O_5 feed by first determining the total mass rate in metric ton/hr of phosphorus-bearing feed using a flow monitoring device meeting the requirements of par. (a) and then proceeding according to sub. ~~(5)(d)2~~ (5)(b)3.

SECTION 101. NR 440.38(5) is repealed and recreated to read:

NR 440.38(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the total fluorides standard in sub. (3) as follows:

1. The emission rate (E) of total fluorides shall be computed for each run using the following equation:

$$E = \left(\sum_{i=1}^{N} C_{si} Q_{sdi}\right)/(PK)$$

where:

E is the emission rate of total fluorides, g/metric ton (lb/ton) of equivalent P_2O_5 feed

C_{si} is the concentration of total fluorides from emission point "i", mg/dscm (mg/dscf)

Q_{sdi} is the volumetric flow rate of effluent gas from emission point "i", dscm/hr (dscf/hr)

N is the number of emission points associated with the affected facility

P is the equivalent P_2O_5 feed rate, metric ton/hr (ton/hr)

K is the conversion factor, 1000 mg/g (453,600 mg/lb)

2. Method 13A or 13B shall be used to determine the total fluorides concentration (C_{si}) and volumetric flow rate (Q_{sdi}) of the effluent gas from each of the emission points. The sampling shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The equivalent P_2O_5 feed rate (P) shall be computed for each run using the following equation:

$$P = M_p R_p$$

where:

M_p is the total mass flow rate of phosphorus-bearing feed, metric ton/hr (ton/hr)

R_p is the P_2O_5 content, decimal fraction

a. The accountability system of sub. (4)(a) shall be used to determine the mass flow rate (M_p) of the phosphorus-bearing feed.

b. The Association of Official Analytical Chemists (AOAC) Method 9, incorporated by reference in s. NR 440.17, shall be used to determine the P_2O_5 content (R_p) of the feed.

SECTION 102. NR 440.39(4)(b) is amended to read:

NR 440.39(4)(b) The owner or operator of any granular diammonium phosphate plant shall maintain a daily record of equivalent P_2O_5 feed by first determining the total mass rate in metric ton/hr of phosphorus-bearing feed using a flow monitoring device meeting the requirements of par. (a) and then proceeding according to sub. ~~(5)(d)2~~ (5)(b)3.

SECTION 103., NR 440.39(5) is repealed and recreated to read:

NR 440.39(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the total fluorides standard in sub. (3) as follows:

1. The emission rate (E) of total fluorides shall be computed for each run using the following equation:

$$E = \left(\sum_{i=1}^{N} C_{si} Q_{sdi}\right)/(PK)$$

where:

E is the emission rate of total fluorides, g/metric ton (lb/ton) of equivalent P_2O_5 feed

C_{si} is the concentration of total fluorides from emission point "i", mg/dscm (mg/dscf)

Q_{sdi} is the volumetric flow rate of effluent gas from emission point "i", dscm/hr (dscf/hr)

N is the number of emission points associated with the affected facility

P is the equivalent P_2O_5 feed rate, metric ton/hr (ton/hr)

K is the conversion factor, 1000 mg/g (453,600 mg/lb)

2. Method 13A or 13B shall be used to determine the total fluorides concentration (C_{si}) and volumetric flow rate (Q_{sdi}) of the effluent gas from each of the emission points. The sampling shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The equivalent P_2O_5 feed rate (P) shall be computed for each run using the following equation:

$$P = M_p R_p$$

where:

M_p is the total mass flow rate of phosphorus-bearing feed, metric ton/hr (ton/hr)

R_p is the P_2O_5 content, decimal fraction

a. The accountability system of sub. (4)(a) shall be used to determine the mass flow rate (M_p) of the phosphorus-bearing feed.

b. The Association of Official Analytical Chemists (AOAC) Method 9, incorporated by reference in s. NR 440.17, shall be used to determine the P_2O_5 content (R_p) of the feed.

SECTION 104. NR 440.40(2)(intro.) and (4)(b) are amended to read:

NR 440.40(2)(intro.) DEFINITIONS. As used in this ~~subsection~~ section, terms not defined in this ~~section~~ subsection have the meanings given in s. NR 440.02.

(4)(b) The owner or operator of any triple superphosphate plant shall maintain a daily record of equivalent P_2O_5 feed by first determining the total mass rate in metric ton/hr of phosphorus-bearing feed using a flow monitoring device meeting the requirements of par. (a) and then proceeding according to sub. ~~(5)(d)2~~ (5)(b)3.

SECTION 105. NR 440.40(5) is repealed and recreated to read:

NR 440.40(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the total fluorides standard in sub. (3) as follows:

1. The emission rate (E) of total fluorides shall be computed for each run using the following equation:

$$E = \left(\sum_{i=1}^{N} C_{si}\, Q_{sdi}\right)/(PK)$$

where:

E is the emission rate of total fluorides, g/metric ton (lb/ton) of equivalent P_2O_5 feed

C_{si} is the concentration of total fluorides from emission point "i", mg/dscm (mg/dscf)

Q_{sdi} is the volumetric flow rate of effluent gas from emission point "i", dscm/hr (dscf/hr)

N is the number of emission points associated with the affected facility

P is the equivalent P_2O_5 feed rate, metric ton/hr (ton/hr)

K is the conversion factor, 1000 mg/g (453,600 mg/lb)

2. Method 13A or 13B shall be used to determine the total fluorides concentration (C_{si}) and volumetric flow rate (Q_{sdi}) of the effluent gas from each of the emission points. The sampling shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The equivalent P_2O_5 feed rate (P) shall be computed for each run using the following equation:

$$P = M_p R_p$$

where:

M_p is the total mass flow rate of phosphorus-bearing feed, metric ton/hr (ton/hr)

R_p is the P_2O_5 content, decimal fraction

a. The accountability system of sub. (4)(a) shall be used to determine the mass flow rate (M_p) of the phosphorus-bearing feed.

b. The Association of Official Analytical Chemists (AOAC) Method 9, incorporated by reference in s. NR 440.17, shall be used to determine the P_2O_5 content (R_p) of the feed.

SECTION 106. NR 440.41(4)(b) is amended to read:

NR 440.41(4)(b) The owner or operator of any granular triple superphosphate storage facility shall maintain a daily record of total equivalent P_2O_5 stored by multiplying the percentage P_2O_5 content, as determined by sub. ~~(5)(f)2.~~ (5)(c)3, times the total mass of granular triple superphosphate stored.

SECTION 107. NR 440.41(5) is repealed and recreated to read:

NR 440.41(5) TEST METHODS AND PROCEDURES. (a) The owner or operator shall conduct performance tests required in s. NR 440.08 only when the following quantities of products are being cured or stored in the facility.

1. Total granular triple superphosphate is at least 10% of the building capacity and

2. Fresh granular triple superphosphate is at least 20% of the total amount of triple superphosphate, or

3. If the provision in subd. 2 exceeds production capabilities for fresh granular triple superphosphate, fresh granular triple superphosphate is equal to at least 5 days maximum production.

(b) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR

440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(c) The owner or operator shall determine compliance with the total fluorides standard in sub. (3) as follows:

1. The emission rate (E) of total fluorides shall be computed for each run using the following equation:

$$E = \left(\sum_{i=1}^{N} C_{si} Q_{sdi}\right)/(PK)$$

where:

E is the emission rate of total fluorides, g/metric ton (lb/ton) of equivalent P_2O_5 stored

C_{si} is the concentration of total fluorides from emission point "i", mg/dscm (mg/dscf)

Q_{sdi} is the volumetric flow rate of effluent gas from emission point "i", dscm/hr (dscf/hr)

N is the number of emission points associated with the affected facility

P is the equivalent P_2O_5 stored, metric ton/hr (ton/hr)

K is the conversion factor, 1000 mg/g (453,600 mg/lb)

2. Method 13A or 13B shall be used to determine the total fluorides concentration (C_{si}) and volumetric flow rate (Q_{sdi}) of the effluent gas from each of the emission points. The sampling shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The equivalent P_2O_5 feed rate (P) shall be computed for each run using the following equation:

$$P = M_p R_p$$

where:

M_p is the amount of product in storage, metric ton (ton)

R_p is the P_2O_5 content of product in storage, weight fraction

a. The accountability system of sub. (4)(a) shall be used to determine the amount of product (M_p) in storage.

b. The Association of Official Analytical Chemists (AOAC) Method 9, incorporated by reference in s. NR 440.17, shall be used to determine the P_2O_5 content (R_p) of the product in storage.

SECTION 108. NR 440.42(4)(b) is amended to read:

NR 440.42(4)(b) All monitoring devices under par. (a) shall be recalibrated annually in accordance with procedures under s. NR 440.13(2)~~(e)~~.

SECTION 109. NR 440.42(5) is repealed and recreated to read:

NR 440.42(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the total fluorides standard in sub. (3) as follows:

1. Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). Sampling shall begin no less than 30 minutes after startup and shall terminate before shutdown procedures begin.

2. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 110. NR 440.43(7) is repealed and recreated to read:

NR 440.43(7) TEST METHODS AND PROCEDURES. (a) During any performance test required in s. NR 440.08, the owner or operator may not allow gaseous diluents to be added to the effluent gas stream after the fabric in an open pressurized fabric filter collector unless the total gas volume flow from the collector is accurately determined and considered in the determination of emissions.

(b) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(c) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (\sum_{i=1}^{N} C_{si}\ Q_{sdi})/(PK)$$

where:

E is the emission rate of particulate matter, kg/MW-hr (lb/MW-hr)

N is the total number of exhaust streams at which emissions is quantified

C_{si} is the concentration of particulate matter from exhaust stream "i", g/dscm (g/dscf)

Q_{sdi} is the volumetric flow rate of effluent gas from exhaust stream "i", dscm/hr (dscf/hr)

P is the average furnace power input, MW

K is the conversion factor, 1000 g/kg (453.6 g/lb)

2. Method 5 shall be used to determine the particulate matter concentration (C_{si}) and volumetric flow rate (Q_{sdi}) of the effluent gas, except that the heating systems specified in sections 2.1.2 and 2.1.6 of Method 5 are not to be used when the carbon monoxide content of the gas stream exceeds 10% by volume, dry basis. If a flare is used to comply with sub. (4), the sampling site shall be upstream of the flare. The sampling time shall include an integral number of furnace cycles.

a. When sampling emissions from open electric submerged arc furnaces with wet scrubber control devices, sealed electric submerged arc furnaces or semienclosed electric arc furnaces, the sampling time and sample volume for each run shall be at least 60 minutes and 1.80 dscm (63.6 dscf).

b. When sampling emissions from other types of installations, the sampling time and sample volume for each run shall be at least 200 minutes and 5.70 dscm (200 dscf).

3. The measurement device of sub. (6)(b) shall be used to determine the average furnace power input (P) during each run.

4. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

5. The emission rate correction factor, integrated sampling procedures of Method 3B shall be used to determine the CO concentration. The sample shall be taken simultaneously with each particulate matter sample.

(d) During the particulate matter run, the maximum open hood area, in hoods with segmented or otherwise moveable sides, under which the process is expected to be operated and remain in compliance with all standards shall be recorded. Any future operation of the hooding system with open areas in excess of the maximum is not permitted.

(e) To comply with sub. (6)(d) or (f), the owner or operator shall use the monitoring devices in sub. (6)(c) or (e) to make the required measurements as determined during the performance test.

SECTION 111. NR 440.44(4)(c) is repealed and recreated to read:

NR 440.44(4)(c) A continuous monitoring system is not required on any modular, multiple-stack, negative-pressure or positive-pressure fabric filter if observations of the opacity of the visible emissions from the control device are performed by a certified visible emissions observer as follows: Visible emission observations shall be conducted at least once per day when the furnace is operating in the melting and refining period. These observations shall be taken in accordance with Method 9, and, for at least 3 6-minute periods, the opacity shall be recorded for any point where visible emissions are observed. Where it is possible to determine that a number of visible emission sites relate to only one incident of the visible emission, only one set of 3 6-minute observations will be required. In this case, Method 9 observations shall be made for the site of highest opacity that directly relates to the cause, or location, of visible emissions observed during a single incident. Records shall be maintained of any 6-minute average that is in excess of the emission limit specified in sub. (3)(a).

SECTION 112. NR 440.44(5)(i)4. is amended to read:

NR 440.44(5)(i)4. Continuous monitor data or ~~Reference~~ Method 9 of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, data.

SECTION 113. NR 440.44(6)(a) to (f) are repealed and recreated to read:

NR 440.44(6)(a) During performance tests required in s. NR 440.08, the owner or operator may not add gaseous diluent to the effluent gas after the fabric in any pressurized fabric collector, unless the amount of dilution is separately determined and considered in the determination of emissions.

(b) When emissions from any EAF are combined with emissions from facilities not subject to the provisions of this section but controlled by a common capture system and control device, the owner or operator shall use either or both of the following procedures during a performance test:

Note: See also sub. (7)(b).

1. Determine compliance using the combined emissions.

2. Use a method that is acceptable to the department and that compensates for the emissions from the facilities not subject to the provisions of this section.

(c) When emissions from any EAF are combined with emissions from facilities not subject to the provisions of this section, the owner or operator shall use either or both of the following procedures to demonstrate compliance with sub. (3)(a)3:

1. Determine compliance using the combined emissions.

2. Shut down operation of facilities not subject to the provisions of this section during the performance test.

(d) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(e) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. Method 5 shall be used for negative-pressure fabric filters and other types of control devices and Method 5D shall be used for positive-pressure fabric filters to determine the particulate matter concentration and, if applicable, the volumetric flow rate of the effluent gas. The sampling time and sample volume for each run shall be at least 4 hours and 4.5 dscm (160 dscf) and, when a single EAF is sampled, the sampling time shall include an integral number of heats.

2. When more than one control device serves the EAF being tested, the concentration of particulate matter shall be determined using the following equation:

$$c_{st} = [\sum_{i=1}^{n} (c_{si}Q_{sdi})]/\sum_{i=1}^{n} Q_{sdi}$$

where:

c_{st} is the average concentration of particulate matter, mg/dscm (gr/dscf)

c_{si} is the concentration of particulate matter from control device "i", mg/dscm (gr/dscf)

n is the total number of control devices tested

Q_{sdi} is the volumetric flow rate of stack gas from control device "i", dscm/hr (dscf/hr)

3. Method 9 and the procedures of s. NR 440.11 shall be used to determine opacity.

4. To demonstrate compliance with sub. (3)(a)1 to 3, the test runs shall be conducted concurrently, unless inclement weather interferes.

(f) To comply with sub. (5)(c), (f), (g) and (i), the owner or operator shall obtain the information in these paragraphs during the particulate matter runs.

SECTION 114. NR 440.44(7)(b) is amended to read:

NR 440.44(7)(b) When the owner or operator of an EAF is required to demonstrate compliance with the standard under sub. ~~(6)(g)2. or 3.~~ (6)(b)2 or a combination of sub. (6)(b)1 and 2 the owner or operator shall obtain approval from the department of the procedure that will be used to determine compliance. Notification of the procedure to be used shall be postmarked 30 days prior to the performance test.

SECTION 115. NR 440.445(4)(c) and (6)(a) to (c) are repealed and recreated to read:

NR 440.445(4)(c) A continuous monitoring system for the measurement of opacity is not required on modular, multiple-stack, negative-pressure or positive-pressure fabric filters if observations of the opacity of the visible emissions from the control device are performed by a certified visible emission observer as follows: Visible emission observations are conducted at least once per day when the furnace is operating in the melting and refining period. These observations shall be taken in accordance with Method 9, and, for at least 3 6-minute periods, the opacity shall be recorded for any point where visible emissions are observed. Where it is possible to determine that a number of visible emission sites relate to only one incident of the visible emissions, only one set of 3 6-minute observations will be required. In this case, Method 9 observations shall be made for the site of highest opacity that directly relates to the cause, or location, of visible emissions observed during a single incident. Records shall be maintained of any 6-minute average that is in excess of the emission limit specified in sub. (3).

(6)(a) During performance tests required in s. NR 440.08, the owner or operator may not add gaseous diluents to the effluent gas stream after the fabric in any pressurized fabric filter collector, unless the amount of dilution is separately determined and considered in the determination of emissions.

(b) When emissions from any EAF or AOD vessel are combined with emissions from facilities not subject to the provisions of this section but controlled by a common capture system and control device, the owner or operator shall use either or both of the following procedures during a performance test:

Note: See also sub. (7)(e).

1. Determine compliance using the combined emissions.

2. Use a method that is acceptable to the department and that compensates for the emissions from the facilities not subject to the provisions of this section.

(c) When emission from any EAF or AOD vessel are combined with emissions from facilities not subject to the provisions of this section, the owner or operator shall demonstrate compliance with sub. (3)(a)3 based on emissions from only the affected facility.

SECTION 116. NR 440.445(6)(d) is renumbered NR 440.445(7)(f)

SECTION 117. NR 440.445(6)(e) and (f) are repealed:

SECTION 118. NR 440.445(6)(d) to (f) are created to read:

NR 440.445(6)(d) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(e) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. Method 5 shall be used for negative-pressure fabric filters and other types of control devices and Method 5D shall be used for positive-pressure fabric filters to determine the particulate matter concentration and volumetric flow rate of the effluent gas. The sampling time and sample volume for each run shall be at least 4 hours and 4.50 dscm (160 dscf) and, when a single EAF or AOD vessel is sampled, the sampling time shall include an integral number of heats.

2. When more than one control device serves the EAF being tested, the concentration of particulate matter shall be determined using the following equation:

$$c_{st} = [\sum_{i=1}^{n} (c_{si} Q_{sdi})] / \sum_{i=1}^{n} Q_{sdi}$$

where:

c_{st} is the average concentration of particulate matter, mg/dscm (gr/dscf)

c_{si} is the concentration of particulate matter from control device "i", mg/dscm (gr/dscf)

n is the total number of control devices tested

Q_{sdi} is the volumetric flow rate of stack gas from control device "i", dscm/hr (dscf/hr)

3. Method 9 and the procedures of s. NR 440.11 shall be used to determine opacity.

4. To demonstrate compliance with sub. (3)(a)1 to 3, the test runs shall be conducted concurrently, unless inclement weather interferes.

(f) To comply with sub. (5)(c) and (f) to (h), the owner or operator shall obtain the information required in these paragraphs during the particulate matter runs.

SECTION 119. NR 440.445(7)(e) is amended to read:

NR 440.445(7)(e) When the owner or operator of an EAF or AOD is required to demonstrate compliance with the standard under sub. ~~(6)(h)2. or 3.~~ (6)(b)2 or a combination of sub. (6)(b)1 and 2 the owner or operator shall obtain approval from the department of the procedure that will be used to determine compliance. Notification of the procedure to be used shall be postmarked 30 days prior to the performance test.

SECTION 120. NR 440.45(6) is repealed and recreated to read:

NR 440.45(6) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures in this subsection, except as provided in s. NR 440.08(2). Acceptable alternative methods and procedures are given in par. (f).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3)(a)1 and 3 as follows:

1. Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Water shall be used as the cleanup solvent instead of acetone in the sample recovery procedure. The particulate concentration shall be corrected to the appropriate oxygen concentration according to sub. (5)(c)3.

2. The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the oxygen concentration. The gas sample shall be taken at the same time and at the same traverse points as the particulate sample.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(c) The owner or operator shall determine compliance with the particulate matter standard in sub. (3)(a)2 as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = c_s Q_{sd}/BLS$$

where:

E is the emission rate of particulate matter, g/kg (lb/ton) of BLS

c_s is the concentration of particulate matter, g/dsm (lb/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

BLS is the black liquor solids (dry weight) feed rate, kg/hr (ton/hr)

2. Method 5 shall be used to determine the particulate matter concentration (c_s) and the volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Water shall be used instead of acetone in the sample recovery.

3. Process data shall be used to determine the black liquor solids (BLS) feed rate on a dry weight basis.

(d) The owner or operator shall determine compliance with the TRS standards in sub. (4), except par. (a)1 f and 4, as follows:

1. Method 16 shall be used to determine the TRS concentration. The TRS concentration shall be corrected to the appropriate oxygen concentration using the procedure in sub. (5)(c)3. The sampling time shall be at least 3 hours, but no longer than 6 hours.

2. The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the oxygen concentration. The sample shall be taken over the same time period as the TRS samples.

3. When determining whether a furnace is a straight kraft recovery furnace or a cross recovery furnace, TAPPI Method T.624, incorporated by reference in s. NR 440.17, shall be used to determine sodium sulfide, sodium hydroxide, and sodium carbonate. These determinations shall be made 3 times daily from the green liquor, and the daily average values shall be converted to sodium oxide (Na_2O) and substituted into the following equation to determine the green liquor sulfidity:

$$GLS = 100\ C_{Na_2S}/(C_{Na_2S} + C_{NaOH} + C_{Na_2CO_3})$$

where:

GLS is the green liquor sulfidity, percent

C_{Na_2S} is the concentration of Na_2S as Na_2O, mg/liter (gr/gal)

C_{NaOH} is the concentration of NaOH as Na_2O, mg/liter (gr/gal)

$C_{Na_2CO_3}$ is the concentration of Na_2CO_3 as Na_2O, mg/liter (gr/gal)

(e) The owner or operator shall determine compliance with the TRS standards in sub. (4)(a)1 f and 4 as follows:

1. The emission rate (E) of TRS shall be computed for each run using the following equation:

$$E = C_{TRS}\ F\ Q_{sd}/P$$

where:

E is the emission rate of TRS, g/kg (lb/ton) of BLS or ADP

C_{TRS} is the average combined concentration of TRS, ppm

F is the conversion factor, 0.001417 g H_2S/m^3 ppm (0.0844 × 10^{-6} lb H_2S/ft^3 ppm)

Q_{sd} is the volumetric flow rate of stack gas, dscm/hr (dscf/hr)

P is the black liquor solids feed or pulp production rate, kg/hr (ton/hr)

2. Method 16 shall be used to determine the TRS concentration (C_{TRS}).

3. Method 2 shall be used to determine the volumetric flow rate (Q_{sd}) of the effluent gas.

4. Process data shall be used to determine the black liquor feed rate or the pulp production rate (P).

(f) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this subsection:

1. For Method 5, Method 17 may be used if a constant value of 0.009 g/dscm (0.004 gr/dscf) is added to the results of Method 17 and the stack temperature is no greater than 205°C (400°F).

2. For Method 16, Method 16A or 16B may be used if the sampling time is 60 minutes.

SECTION 121. NR 440.46(2)(c), (d), (i) and (1), (3)(a)2. and Table 1 are amended to read:

NR 440.46(2)(c) "Container glass" means glass made of soda-lime recipe, clear or colored, which is pressed or blown, or both, into bottles, jars, ampoules and other products listed ~~in Standard Industrial Classification~~ under SIC code 3221 in the Standard Industrial Classification Manual, incorporated by reference in s. NR 440.17.

(d) "Flat glass" means glass made of soda-lime recipe and produced into continuous flat sheets and other products listed ~~in Standard Industrial Classification~~ under SIC code 3211 in the Standard Industrial Classification Manual, incorporated by reference in s. NR 440.17.

(i) "Pressed and blown glass" means glass which is pressed, blown, or both, including textile fiberglass, noncontinuous flat glass, noncontainer glass and other products listed ~~in Standard Industrial Classification~~ under SIC code 3229 in the Standard Industrial Classification Manual, incorporated by reference in s. NR 440.17. It is separated into glass of borosilicate recipe, glass of soda-lime and lead recipes, glass of opal, fluoride and other recipes.

(1) "Wool fiberglass" means fibrous glass of random texture, including fiberglass insulation, and other products listed ~~in Standard Industrial Classification~~ under SIC code 3296 in the Standard Industrial Classification Manual, incorporated by reference in s. NR 440.17.

(3)(a)2. From any glass melting furnace, fired simultaneously with gaseous and liquid fuels, particulate matter at emission rates exceeding STD as specified by the following equation:

$$STD = X\ [1.3(Y) + (Z)]$$

where:

STD is the particulate matter emission limit, g of particulate/kg of glass produced

X is the emission rate specified in Table 1 for furnaces fired with gaseous fuel (Column 2)

Y is the decimal ~~percent~~ fraction of liquid fuel heating value to total (gaseous and liquid) fuel heating value fired in the glass melting furnaces as determined in sub. (7)~~(f)~~(b) (joules/joules)

Z is equal to (1-Y)

Table 1 -- Emission Rates

[g of particulate/kg of glass produced]

Col. 1 -- Glass manufacturing plant industry segment	Col. 2-- Furnace fired with gaseous fuel	Col. 3-- Furnace fired with liquid fuel
Container glass	~~0.1~~ 0.10	0.13
Pressed and blown glass		
(a) Borosilicate Recipes	~~0.5~~ 0.50	0.65
(b) Soda-Lime and Lead Recipes	~~0.1~~ 0.10	0.13
(c) Other-Than Borosilicate, Soda-Lime, and Lead Recipes (including opal, fluoride and other recipes)	0.25	0.325
Wool fiberglass	0.25	0.325
Flat glass	0.225	0.225

SECTION 122. NR 440.46(7) is repealed and recreated to read:

NR 440.46(7) TEST METHODS AND PROCEDURES. (a) If a glass melting furnace with modified processes is changed to one without modified processes or if a glass melting furnace without modified processes is changed to one with modified processes, the owner or operator shall notify the department at least 60 days before the change is schedule to occur.

(b) When gaseous and liquid fuels are fired simultaneously in a glass melting furnace, the owner or operator shall determine the applicable standard under sub. (3)(a)2 as follows:

1. The ratio (Y) of liquid fuel heating value to total (gaseous and liquid) fuel heating value fired in the glass melting furnaces shall be computed for each run using the following equation:

$$Y = (H_l L)/(H_l L + H_g G)$$

where:

Y is the decimal fraction of liquid fuel heating value to total fuel heating value

H_l is the gross calorific value of liquid fuel, J/kg

H_g is the gross calorific value of gaseous fuel, J/kg

L is the liquid flow rate, kg/hr

G is the gaseous flow rate, kg/hr

2. Suitable methods shall be used to determine the rates (L and G) of fuels burned during each test period and a material balance over the glass melting furnace shall be used to confirm the rates.

3. American Society of Testing and Materials (ASTM) Method D240-76 (liquid fuels) and D1826-77 (gaseous fuels), incorporated by reference in s. NR 440.17, as applicable, shall be used to determine the gross calorific values.

(c) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(d) The owner or operator shall determine compliance with the particulate matter standards in subs. (3) and (4) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (c_s Q_{sd} - A)/P$$

where:

E is the emission rate of particulate matter, g/kg

c_s is the concentration of particulate matter, g/dsm

Q_{sd} is the volumetric flow rate, dscm/hr

A is the zero production rate correction

= 227 g/hr for container glass, pressed and blown (soda-lime and lead) glass, and pressed and blown (other than borosilicate, soda-lime and lead) glass

= 454 g/hr for pressed and blown (borosilicate) glass, wool fiberglass, and flat glass

P is the glass production rate, kg/hr

2. Method 5 shall be used to determine the particulate matter concentration (c_s) and volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). The probe and filter holder heating system may be set

to provide a gas temperature no greater than 177±14°C (350±25°F), except under the conditions specified in sub. (4)(e).

3. Direct measurement or material balance using good engineering practice shall be used to determine the amount of glass pulled during the performance test. The rate of glass produced is defined as the weight of glass pulled from the affected facility during the performance test divided by the number of hours taken to perform the performance test.

4. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

SECTION 123. NR 440.47(4) is repealed and recreated to read:

NR 440.47(4) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2). Acceptable alternative methods and procedures are given in par. (c).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. Method 5 shall be used to determine the particulate matter concentration and the volumetric flow rate of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 1.70 dscm (60 dscf). The probe and filter holder shall be operated without heaters.

2. Method 2 shall be used to determine the ventilation volumetric flow rate.

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(c) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this subsection:

1. For Method 5, Method 17 may be used.

SECTION 124. NR 440.48(6)(b) is repealed and recreated to read:

NR 440.48(6)(b) Following the initial performance test, the owner or operator of an affected facility shall identify, record, and submit a written report to the department every calendar quarter of each instance in which the volume-weighted average of the total mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) is greater than the limit specified under sub. (3). If no such instances have occurred during a particular quarter, a report stating this shall be submitted to the department semiannually.

SECTION 125. NR 440.48(6)(c) is renumbered NR 440.48(6)(d).

SECTION 126. NR 440.48(6)(c) is created to read:

NR 440.48(6)(c) Following the initial performance test, the owner or operator of an affected facility shall identify, record, and submit at the frequency specified in s. NR 440.07(3) the following:

1. Where compliance with sub. (3) is achieved through the use of thermal incineration, each 3-hour period when metal furniture is being coated during which the average temperature of the device was more than 28°C below the average temperature of the device during the most recent performance test at which destruction efficiency was determined as specified under sub. (4).

2. Where compliance with sub. (3) is achieved through the use of catalytic incineration, each 3-hour period when metal furniture is being coated during which the average temperature of the device immediately before the catalyst bed is more than 28°C below the average temperature of the device immediately before the catalyst bed during the most recent performance test at which destruction efficiency was determined as specified under sub. (4). Additionally, when metal furniture is being coated, all 3-hour periods during which the average temperature difference across the catalyst bed is less than 80% of the average temperature difference across the catalyst bed during the most recent performance test at which destruction efficiency was determined as specified under sub. (4) will be recorded.

3. For thermal and catalytic incinerators, if no periods as described in subd. 1 and 2 occur, the owner or operator shall state this in the report.

SECTION 127. NR 440.50(6) is repealed and recreated to read:

NR 440.50(6) TEST METHODS AND PROCEDURES. (a) To compute the nitrogen oxides emissions, the owner or operator shall use analytical methods and procedures that are accurate to within 5% and are approved by the department to determine the nitrogen content of the fuel being fired.

(b) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR

440.17, or other methods and procedures as specified in this subsection, except as provided for in s. NR 440.08(2). Acceptable alternative methods and procedures are given in par. (f).

(c) The owner or operator shall determine compliance with the nitrogen oxides and sulfur dioxide standards in subs. (3) and (4)(a) as follows:

1. The nitrogen oxides emission rate (NO_x) shall be computed for each run using the following equation:

$$NO_x = (NO_{xo})(P_r/P_o)^{0.5}e^{19(H_o - 0.00633)}(288K/T_a)^{1.53}$$

where:

NO_x is the emission rate of NO_x at 15% O_2 and ISO standard ambient conditions, volume percent

NO_{xo} is the observed NO_x concentration, ppm by volume

P_r is the reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg

P_o is the observed combustor inlet absolute pressure at test, mm Hg

H_o is the observed humidity of ambient air, g H_2O/g air

T_a is the ambient temperature K

2. The monitoring device of sub. (5)(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with sub. (3) at 30, 50, 75 and 100% of peak load or at 4 points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

3. Method 20 shall be used to determine the nitrogen oxides, sulfur dioxide and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21% oxygen. The NO_x emissions shall be determined at each of the load conditions specified in subd. 2.

(d) The owner or operator shall determine compliance with the sulfur content standard in sub. (4)(b) as follows: ASTM D2880-78 shall be used to determine the sulfur content of liquid fuels and ASTM D1072-80, D3031-81, D4084-82 or D3246-81 shall be used for the sulfur content of gaseous fuels, incorporated by reference in s. NR 440.17. The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis, with verification of the dilution ratio, may be used, subject to the approval of the department.

(e) To meet the requirements of sub. (5)(b), the owner or operator shall use the methods specified in pars. (a) and (d) to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor or any other qualified agency.

(f) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this subsection:

1. Instead of using the equation in par. (b)1, manufacturers may develop ambient condition correction factors to adjust the nitrogen oxides emission level measured by the performance test as provided in s. NR 440.08 to ISO standard day conditions. These factors are developed for each gas turbine model they manufacture in terms of combustion inlet pressure, ambient air pressure, ambient air humidity, and ambient air temperature. They shall be substantiated with data and shall be approved for use by the administrator before the initial performance test required by s. NR 440.08. Notices of approval of custom ambient condition correction factors will be published in the federal register by the administrator.

SECTION 128. NR 440.51(4)(e) is amended to read:

NR 440.51(4)(e) For the purpose of reports required under s. NR 440.07(3) periods of excess emissions that shall be reported are defined as all 6-minute periods during which the average opacity of the plume from any lime kiln subject to par. (a) is greater than 15% or, in the case of wet scrubbers, any period in which the scrubber pressure drop is greater than 30% below the rate established during the performance test. ~~Reports of excess emissions recorded during observations made as required by sub. (5)(e)~~ If visible emission observations are made according to par. (b), reports of excess emissions shall be submitted semiannually.

SECTION 129. NR 440.51(5) is repealed and recreated to read:

NR 440.51(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3)(a) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E - (c_s\ Q_{sd})/PK)$$

where:

E is the emission rate of particulate matter, kg/Mg (lb/ton) of stone feed

c_s is the concentration of particulate matter, g/dscm (g/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P is the stone feed rate, Mg/hr (ton/hr)

K is the conversion factor, 1000 g/kg (453.6 g/lb)

2. Method 5 shall be used at negative-pressure fabric filters and other types of control devices and Method 5D shall be used as positive-pressure fabric filters to determine the particulate matter concentration (c_s) and the volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf).

3. The monitoring device of sub. (4)(d) shall be used to determine the stone feed rate (P) for each run.

4. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(c) During the particulate matter run, the owner or operator shall use the monitoring devices in sub. (4)(c)1 and 2 to determine the average pressure loss of the gas stream through the scrubber and the average scrubbing liquid supply pressure.

SECTION 130. NR 440.52(5) is repealed and recreated to read:

NR 440.52(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the lead standards in sub. (3), except par. (a)4, as follows:

1. Method 12 shall be used to determine the lead concentration and, if applicable, the volumetric flow rate (Q_{sda}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

2. When different operations in a 3-process operation facility are ducted to separate control devices, the lead emission concentration (C) from the facility shall be determined as follows:

$$C = [\sum_{a=1}^{N} (C_a Q_{sda})] / \sum_{a=1}^{N} Q_{sda}$$

where:

C is the concentration of lead emissions for the entire facility, mg/dscm (gr/dscf)

C_a is the concentration of lead emissions from facility "a", mg/dscm (gr/dscf)

Q_{sda} is the volumetric flow rate of effluent gas from facility "a", dscm/hr (dscf/hr)

N is the total number of control devices to which separate operations in the facility are ducted

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity. The opacity numbers shall be rounded off to the nearest whole percentage.

(c) The owner or operator shall determine compliance with the lead standard in sub. (3)(a)4 as follows:

1. The emission rate (E) from lead oxide manufacturing facility shall be computed for each run using the following equation:

$$E = [\sum_{i=1}^{M} (C_{Pbi} Q_{sdi})]/(PK)$$

where:

E is the emission rate of lead, mg/kg (lb/ton) of lead charged

C_{Pbi} is the concentration of lead from emission point "i", mg/dscm

Q_{sdi} is the volumetric flow rate of effluent gas from emission point "i", dscm/hr (sdcf/hr)

M is the number of emission points in the affected facility

P is the lead feed rate to the facility, kg/hr (ton/hr)

K is the conversion factor, 1.0 mg/mg (453,600 mg/lb)

2. Method 12 shall be used to determine the lead concentration (C_{Pb}) and the volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The average lead feed rate (P) shall be determined for each run using the following equation:

$$P = NW/\Theta$$

where:

N is the number of lead pigs (ingots) charged

W is the average mass of a pig, kg (ton)

Θ is the duration of run, hr

SECTION 131. NR 440.525(6)(c) is amended to read:

NR 440.525(6)(c) After the initial performance test of a wet scrubber the owner or operator shall submit semiannual reports to the department of occurrences when the measurements of the scrubber pressure loss ~~(or gain)~~ and liquid flow rate differ by more than ±30% from ~~those measurements recorded~~ the average obtained during the most recent performance test.

SECTION 132. NR 440.525(7) is repealed and recreated to read:

NR 440.525(7) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards sub. (3) as follows:

1. Method 5 or 17 shall be used to determine the particulate matter concentration. The sample volume for each run shall be at least 1.70 dscm (60

dscf). The sampling probe and filter holder of Method 5 may be operated without heaters if the gas stream being sampled is at ambient temperature. For gas streams above ambient temperature, the Method 5 sampling train shall be operated with a probe and filter temperature slightly above the effluent temperature, up to a maximum filter temperature of 121°C (250°F), in order to prevent water condensation on the filter.

2. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity from stack emissions and process fugitive emissions. The observer shall read opacity only when emissions are clearly identified as emanating solely from the affected facility being observed.

(c) To comply with sub. (6)(c) the owner or operator shall use the monitoring devices in sub. (5)(a) and (b) to determine the pressure loss of the gas stream through the scrubber and scrubbing liquid flow rate at any time during each particulate matter run, and the average of the 3 determinations shall be computed.

SECTION 133. NR 440.53(6)(b) is repealed and recreated to read:

NR 440.53(6)(b) Following the initial performance test, the owner or operator of an affected facility shall identify, record and submit a written report to the department every calendar quarter of each instance in which the volume-weighted average of the total mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) is greater than the limit specified under sub. (3). If no instances have occurred during a particular quarter, a report stating this shall be submitted to the department semiannually. Where compliance is achieved through the use of a capture system and control device, the volume-weighted average after the control device shall be reported.

SECTION 134. NR 440.53(6)(c)(intro.) is amended to read:

NR 440.53(6)(c)(intro.) Where compliance with sub. (3) is achieved through the use of incineration, the owner or operator shall continuously record the incinerator combustion temperature during coating operations for ~~the~~ thermal incineration or the gas temperature upstream and downstream of the incinerator catalyst bed during coating operations for catalytic incineration. The owner or operator shall ~~report quarterly as follows:~~ <u>submit a written report at the frequency specified in s. NR 440.07(3) and as defined as follows:</u>

SECTION 135. NR 440.54(5) is repealed and recreated to read:

NR 440.54(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided for in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (c_s Q_{sd})/(PK)$$

where:

E is the emission rate of particulate matter kg/Mg (lb/ton) of phosphate rock feed

c_s is the concentration of particulate matter, g/dscm (g/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P is the phosphate rock feed rate, Mg/hr (ton/hr)

K is the conversion factor, 1000 g/kg (453.6 g/lb)

2. Method 5 shall be used to determine the particulate matter concentration (c_s) and volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf).

3. The device of sub. (4)(d) shall be used to determine the phosphate rock feed rate (P) for each run.

4. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(c) To comply with sub. (4)(f), if applicable, the owner or operator shall use the monitoring devices in sub. (4)(c)1 and 2 to determine the average pressure loss of the gas stream through the scrubber and the average scrubbing supply pressure during the particulate matter runs.

SECTION 136. NR 440.55(5) is repealed and recreated to read:

NR 440.55(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (c_s Q_{sd})/(PK)$$

where:

E is the emission rate of particulate matter, kg/Mg (lb/ton) of ammonium sulfate produced

c_s is the concentration of particulate matter, g/dscm (g/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P is the production rate of ammonium sulfate, Mg/hr (ton/hr)

K is the conversion factor, 1000 g/kg (453.6 g/lb)

2. Method 5 shall be used to determine the particulate matter concentration (c_s) and volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume for each run shall be at least 60 minutes and 1.50 dscm (53 dscf).

3. Direct measurement using product weigh scales or computed from material balance shall be used to determine the rate (P) of the ammonium sulfate production. If production rate is determined by material balance, the following equations shall be used:

a. For synthetic and coke oven by-product ammonium sulfate plants:

$$P = ABCK'$$

where:

A is the sulfuric acid flow rate to the reactor/crystallizer averaged over the time period taken to conduct the run, liter/min

B is the acid density (a function of acid strength and temperature), g/cc

C is the acid strength, decimal fraction

K' is the conversion factor, 0.0808 (Mg-min-cc)/(g-hr-liter) [0.0891 (ton-min-cc)/(g-hr-liter)]

b. For caprolactam by-product ammonium sulfate plants:

$P = DEFK''$

where:

D is the total combined feed stream flow rate to the ammonium crystallizer before the point where any recycle streams enter the stream averaged over the time period taken to conduct the test run, liter/min

E is the density of the process stream solution, g/liter

F is the percent mass of ammonium sulfate in the process solution, decimal fraction

K" is the conversion factor, 6.0×10^{-5} (Mg-min)/(g-hr) [6.614×10^{-5} (ton-min)/g-hr)]

3. Method 9 and the procedures in s. NR 440.11 shall be used to determine the opacity.

SECTION 137. NR 440.56(2)(b)10m. is created to read:

NR 440.56(2)(b)10m. L_{gi} = the measured liquid volume of each VOC solvent (i) with corresponding density, D_{gi} used as a cleaning agent at the subject facility.

SECTION 138. NR 440.565(8)(b) is repealed and recreated to read:

NR 440.565(8)(b) Following the initial performance test, the owner or operator of each affected facility shall submit quarterly reports to the department of exceedances of the VOC emission limits specified in sub. (3). If no exceedances occur during a particular quarter, a report stating this shall be submitted to the department semiannually.

SECTION 139. NR 440.565(8)(c) is created to read:

NR 440.565(8)(c) The owner or operator of each affected facility shall also submit reports at the frequency specified in s. NR 440.07(3) when the incinerator temperature drops as defined under sub. (4)(e). If no such periods occur, the owner or operator shall state this in the report.

SECTION 140. NR 440.57(2)(a)(intro.) is amended to read:

NR 440.57(2)(a)(intro.) As used in this section, terms not defined in this paragraph have the ~~meaning~~ meanings given in s. NR 440.02.

SECTION 141. NR 440.57(6)(b) is repealed and recreated to read:

NR 440.57(6)(b) Following the initial performance test, the owner or operator of an affected facility shall identify, record and submit a written report to the department every calendar quarter of each instance in which the volume-weighted average of the total mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) is greater than the limit specified under sub. (3). If no instances have occurred during a particular quarter, a report stating this shall be submitted to the department semiannually.

SECTION 141A. NR 440.57(6)(c) is renumbered 440.57(6)(d).

SECTION 142. NR 440.57(6)(c) is created to read:

NR 440.57(6)(c) Following the initial performance test, the owner or operator of an affected facility shall identify, record and submit at the frequency specified in s. NR 440.07(3) the following:

1. Where compliance with sub. (3) is achieved through use of thermal incineration, each 3-hour period of coating operation during which the average temperature of the device was more than 28°C below the average temperature of the device during the most recent performance test at which destruction efficiency was determined as specified under sub. (4).

2. Where compliance with sub. (3) is achieved through the use of catalytic incineration, each 3-hour period of coating operation during which the average temperature recorded immediately before the catalyst bed is more than 28°C below the average temperature at the same location during the most recent performance test at which destruction efficiency was determined as specified under sub. (4). Additionally, all 3-hour periods of coating operation during which the average temperature difference across the catalyst bed is less than 80% of the average temperature difference across the catalyst bed during the most recent performance test at which destruction efficiency was determined as specified under sub. (4) shall be recorded.

3. For thermal and catalytic incinerators, if no periods as described in subd. 1 and 2 occur, the owner or operator shall state this in the report.

SECTION 143. NR 440.58(6)(c) is renumbered NR 440.58(6)(e).

SECTION 144. NR 440.58(6)(c) and (d) are created to read:

NR 440.58(6)(c) Following the initial performance test, the owner or operator of an affected facility shall identify, record and submit a written report to the department every calendar quarter of each instance in which the volume-weighted average of the local mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) is greater than the limit specified under sub. (3). If no instances have occurred during a particular quarter, a report stating this shall be submitted to the department semiannually.

(d) The owner or operator of each affected facility shall also submit reports at the frequency specified in s. NR 440.07(3) when the incinerator temperature drops as defined under sub. (5)(c). If no periods occur, the owner or operator shall state this in the report.

SECTION 145. NR 440.59(4)(d) is amended to read:

NR 440.59(4)(d) The industry is exempted from the quarterly reports required under s. NR 440.07(3). The owner or operator is required to record and report the operating temperature of the control device during the performance test and, as required by s. NR ~~440.07(4)~~ 440.07(5), maintain a file of the temperature monitoring results for at least 2 years.

SECTION 146. NR 440.59(5) is repealed and recreated to read:

NR 440.59(5) TEST METHODS AND PROCEDURES. (a) For saturators, the owner or operator shall conduct performance tests required in s. NR 440.08 as follows:

1. If the final product is shingle or mineral-surfaced roll roofing, the tests shall be conducted while 106.6-kg (235-lb) shingle is being produced.

2. If the final product is saturated felt or smooth-surfaced roll roofing, the tests shall be conducted while 6.8-kg (15-lb) felt is being produced.

3. If the final product is fiberglass shingle, the test shall be conducted while a nominal 100-kg (220-lb) shingle is being produced.

(b) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(c) The owner or operator shall determine compliance with the particulate matter standards in sub. (3) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (c_s Q_{sd})/(PK)$$

where:

E is the emission rate of particulate matter, kg/Mg

c_s is the concentration of particulate matter, g/dscm (g/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P is the asphalt roofing production rate or asphalt charging rate, Mg/hr (ton/hr)

K is the conversion factor, 1000 g/kg (907.2/(g-Mg)/(kg-ton)]

2. Method 5A shall be used to determine the particulate matter concentration (c_s) and volumetric flow rate (Q_{sd}) of the effluent gas. For a saturator, the sampling time and sample volume for each run shall be at least 120 minutes and 3.00 dscm (106 dscf), and for the blowing still, at least 90 minutes or the duration of the coating blow or non-coating blow, whichever is greater, and 2.25 dscm (79.4 dscf).

3. For the saturator, the asphalt roofing production rate (P) for each run shall be determined as follows: The amount of asphalt roofing produced on the shingle or saturated felt process lines shall be obtained by direct measurement. The asphalt roofing production rate is the amount produced divided by the time taken for the run.

4. For the blowing still, the asphalt charging rate (P) shall be computed for each run using the following equation:

$$P = (Vd)/(K'\Theta)$$

where:

P is the asphalt charging rate to blowing still, Mg/hr (ton/hr)

V is the volume of asphalt charged, m^3 (ft^3)

d is the density of asphalt, kg/m^3 (lb/ft^3)

K' is the conversion factor, 1000 kg/Mg (2000 lb/ton)

Θ is the duration of test run, hr

a. The volume (V) of asphalt charged shall be measured by any means accurate to within 10%.

b. The density (d) of the asphalt shall be computed using the following equation:

$$d = K'' (1056.1 - 0.6176°C)$$

where:

°C is the temperature at the start of the blow, °C

K" is 1.0 [0.06243 $(lb\text{-}m^3)/(ft^3\text{-}kg)$]

5. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(d) The department shall determine compliance with the standards in sub. (3)(a)3 by using Method 22, modified so that readings are recorded every 15 seconds for a period of consecutive observations during representative conditions, in accordance with s. NR 440.08(3), totaling 60 minutes. A performance test shall consist of one run.

(e) The owner or operator shall use the monitoring device in sub. (4)(a) or (b) to monitor and record continuously the temperature during the particulate matter run and shall report the results to the department with the performance test results.

(f) If at a later date the owner or operator believes the emission limits in sub. (3)(a) and (b) are being met even though the temperature measured in accordance with sub. (4)(a) and (b) is exceeding that measured during the performance test, the owner or operator may submit a written request to the department to repeat the performance test and procedure outlined in par. (c).

Note: Under 40 CFR s. 60.474(g), if fuel oil is to be used to fire an afterburner used to control emissions from a blowing still, the owner or operator may petition the administrator in accordance with 40 CFR s. 60.11(e), incorporated by reference in s. NR 440.17, to establish an opacity standard for the blowing still that will be the opacity standard when fuel oil is used to fire the afterburner. To obtain this opacity standard, the owner or operator must request the administrator to determine opacity during an initial or subsequent, performance test when fuel oil is used to fire the afterburner. Upon receipt of the results of the performance test, the administrator finds that the facility was in compliance with the mass standard during the performance test but failed to meet the zero opacity standard, the administrator will establish and promulgate in the Federal Register an opacity standard for the blowing still that will be the opacity standard when fuel oil is used to fire the afterburner. When the afterburner is fired with natural gas, the zero percent opacity remains the applicable opacity standard.

SECTION 147. NR 440.62(2)(a)1.c. and (3)(b)(intro.) are amended to read:

NR 440.62(2)(a)1.c. The applicable basic annual asset guideline repair allowance, B, is selected from the following table consistent with the applicable section:

Table for Determining Applicable Value of B

Section applicable to facility	Value of B to be used in equation
This section	12.5
NR 440.647	12.5
NR 440.66	7.0
NR 440.682	4.5

(3)(b)(intro.) Pumps in light liquid service.

SECTION 148. NR 440.62(4) Note is created to read:

Note: Under s. 60.484 of 40 CFR part 60, each owner or operator subject to the provisions of this section may apply to the administrator for determination of equivalence for any means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to the reduction in emissions of VOC achieved by the controls required in this section. Manufacturers of equipment used to control equipment leaks of VOC may apply to the administrator for determination of equivalence for any equivalent means of emission limitation that achieves a reduction in emissions of VOC achieved by the equipment, design and operational requirements of this section. The administrator will make an equivalence determination according to the provisions of pars. (b), (c), (d), and (e) of s. 60.484, 40 CFR part 60.

SECTION 149. NR 440.62(6) is repealed and recreated to read:

NR 440.62(6) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall determine compliance with the standards in subs. (3) and (4) as follows:

1. Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used:

a. Zero air (less than 10 ppm of hydrocarbon in air); and

b. A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane.

(c) The owner or operator shall determine compliance with the no detectable emission standards in sub. (3)(b)5, (c)9, (d), (g)6 and (j)5 as follows:

1. The requirements of par. (b) shall apply.

2. Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(d) The owner or operator shall test each piece of equipment unless he or she demonstrates that a process unit is not in VOC series, that is, that the VOC content would never be reasonably expected to exceed 10% by weight. For purposes of this demonstration, the following methods and procedures shall be used:

1. Procedures that conform to the general methods in ASTM E168-67, E169-63 or E260-73, incorporated by reference in s. NR 440.17, shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment.

2. Organic compounds that are considered by the department to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid.

3. Engineering judgment may be used to estimate the VOC content, if a piece of equipment has not been shown previously to be in service. If the department disagrees with the judgment, subd. 1 and 2 shall be used to resolve the disagreement.

(e) The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply:

1. The vapor pressure of one or more of the components is greater than 0.3 kPa at 20°C. Standard reference texts or ASTM D2879-83, incorporated by reference in s. NR 440.17, shall be used to determine the vapor pressures.

2. The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 20% by weight.

3. The fluid is a liquid at operating conditions.

(f) Samples used in conjunction with pars. (d), (e) and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare.

(g) The owner or operator shall determine compliance with the standards for flares as follows:

1. Methods 22 shall be used to determine visible emissions.

2. A thermocouple or any other equivalent device shall be used to monitor the presence of a pilot flame in the flare.

3. The maximum permitted velocity (V_{max}) for air-assisted flares shall be computed using the following equation:

$$V_{max} = 8.706 + 0.7084\ H_T$$

where:

V_{max} is the maximum permitted velocity, m/sec

H_T is the net heating value of the gas being combusted, MJ/scm

4. The net heating value (H_T) of the gas being combusted in a flare shall be computed as follows:

$$H_T = K \sum_{i=1}^{n} C_i\ H_i$$

where:

K is the conversion constant, $1.740 \times 10^{-7}\ \frac{(1)}{\text{ppm}}\ \frac{(\text{g-mole})}{\text{scm}}\ \frac{(\text{MJ})}{\text{kcal}}$

C_i is the concentration of sample component "i", ppm

H_i is the net heat of combustion of sample component "i" at 25°C and 760 mm Hg., kcal/g-mole

5. Method 18 and ASTM D2504-67, incorporated by reference in s. NR 440.17, shall be used to determine the concentration of sample component "i".

6. ASTM D2382-76, incorporated by reference in s. NR 440.17, shall be used to determine the net heat of combustion of component "i" if published values are not available or cannot be calculated.

7. Method 2, 2A, 2C or 2D, as appropriate, shall be used to determine the actual exit velocity of a flare. If needed, the unobstructed (free) cross-sectional area of the flare tip shall be used.

SECTION 150. NR 440.62(10)(a) Table A is amended to read:

TABLE A.

CAS No.[a]	Chemical
105-57-7	Acetal
75-07-0	Acetaldehyde
107-89-1	Acetaldol
60-35-5	Acetamide
103-84-4	Acetanilide
64-19-7	Acetic acid
108-24-7	Acetic anhydride
67-64-1	Acetone
75-86-5	Acetone cyanohydrin
75-05-8	Acetonitrile
98-86-2	Acetophenone
75-36-5	Acetyl chloride
74-86-2	Acetylene
107-02-8	Acrolein
79-06-1	Acrylamide
79-10-7	Acrylic acid
107-13-1	Acrylonitrile
124-04-9	Adipic acid
111-69-3	Adiponitrile
(b)	Alkyl naphthalenes
107-18-6	Allyl alcohol
107-05-1	Allyl chloride
1321-11-5	Aminobenzoic acid
111-41-1	Aminoethylethanotamine
123-30-8	p-Aminophenol
628-63-7, 123-92-2	Amyl acetates
71-41-0[c]	Amyl alcohols
110-58-7	Amyl amine
543-59-9	Amyl chloride
110-66-7[c]	Amyl mercaptans
1322-06-1	Amyl phenol
62-53-3	Aniline
142-04-1	Aniline hydrochloride
29191-52-4	Anisidine
100-66-3	Anisole
118-92-3	Anthranilic acid
84-65-1	Anthraquinone
100-52-7	Benzaldehyde
55-21-0	Benzamide
71-43-2	Benzene
98-48-6	Benzenedisulfonic acid
98-11-3	Benzenesulfonic acid
134-81-6	Benzil
76-93-7	Benzilic acid
65-85-0	Benzoic acid
119-53-9	Benzoin
100-47-0	Benzonitrile
119-61-9	Benzophenone
98-07-7	Benzotrichloride
98-88-4	Benzoyl chloride
100-51-6	Benzyl alcohol
100-46-9	Benzylamine
120-51-4	Benzyl benzoate
100-44-7	Benzyl chloride
98-87-3	Benzyl dichloride
92-52-4	Biphenyl
80-05-7	Bisphenol A
10-86-1	Bromobenzene
27497-51-4	Bromonaphthalene
106-99-0	Butadiene
106-98-9	1-Butene
123-86-4	n-Butyl acetate
141-32-2	n-Butyl acrylate
71-36-3	n-Butyl alcohol
78-92-2	s-Butyl alcohol
75-65-0	t-Butyl alcohol
109-73-9	n-Butylamine
13952-84-6	s-Butylamine
75-64-9	t-Butylamine
98-73-7	p-tert-Butyl benzoic acid
107-88-0	1,3-Butylene glycol
123-72-8	n-Butyraldehyde
107-92-6	Butyric acid
106-31-0	Butyric anhydride
109-74-0	Butyronitrite
105-60-2	Caprolactam
75-1-50	Carbon disulfide
558-13-4	Carbon tetrabromide
56-23-5	Carbon tetrachloride
9004-35-7	Cellulose acetate
79-11-8	Chloroacetic acid
108-42-9	m-Chloroaniline
95-51-2	o-Chloroaniline
106-47-8	p-Chloroaniline
35913-09-8	Chlorobenzaldehyde
108-90-7	Chlorobenzene
118-91-2, 535-80-8, 74-11-3[c]	Chlorobenzoic acid
2136-81-4, 2136-89-2, 5216-25-1[c]	Chlorobenzotrichloride
1321-03-5	Chlorobenzoyl chloride
25497-29-4	Chlorodifluoromethane
75-45-6	Chlorodifluorethane
67-66-3	Chloroform
25586-43-0	Chloronaphthalene
88-73-3	o-Chloronitrobenzene
100-00-5	p-Chloronitrobenzene

CAS No.[a]	Chemical
25167-80-0	Chlorophenols
126-99-8	Chloroprene
7790-94-5	Chlorosulfonic acid
108-41-8	m-Chlorotoluene
95-49-8	o-Chlorotoluene
106-43-4	p-Chlorotoluene
75-72-9	Chlorotrifluoromethane
108-39-4	m-Cresol
95-48-7	o-Cresol
106-44-5	p-Cresol
1319-77-3	~~Mixed cresols~~ Cresols (mixed)
1319-77-3	Cresylic acid
4170-30-0	Crotonaldehyde
3724-65-0	Crotonic acid
98-82-8	Cumene
80-15-9	Cumene hydroperoxide
372-09-8	Cyanoacetic acid
506-77-4	Cyanogen chloride
108-80-5	Cyanuric acid
108-77-0	Cyanuric chloride
110-82-7	Cyclohexane
108-93-0	Cyclohexanol
108-94-1	Cyclohexanone
110-83-8	Cyclohexene
108-91-8	Cyclohexylamine
111-78-4	Cyclooctadiene
112-30-1	Decanol
123-42-2	Diacetone alcohol
27576-04-1	Diaminobenzoic acid
95-76-1, 95-82-9, 554-00-7, 608-27-5, 608-31-1, 626-43-7, 27134-27-6, 57311-92-9[c]	Dichloroaniline
541-73-1	m-Dichlorobenzene
95-50-1	o-Dichlorobenzene
106-46-7	p-Dichlorobenzene
75-71-8	Dichlorodifluoromethane
111-44-4	Dichloroethyl ether
107-06-2	1,2-Dichloroethane (EDC)
96-23-1	Dichlorohydrin
26952-23-8	Dichloropropene
101-83-7	Dicyclohexylamine
109-89-7	Diethylamine
111-46-6	Diethylene glycol
112-36-7	Diethylene glycol diethyl ether
111-96-6	Diethylene glycol dimethyl ether
112-34-5	Diethylene glycol monobutyl ether
124-17-7	Diethylene glycol monobutyl ether acetate
111-90-0	Diethylene glycol monoethyl ether
112-15-2	Diethylene glycol monoethyl ether acetate
111-77-3	Diethylene glycol monomethyl ether
64-67-5	Diethyl sulfate
75-37-6	Difluoroethane
25167-70-8	Diisobutylene
26761-40-0	Diisodecyl phthalate
27554-26-3	Diisooctyl phthalate
674-82-8	Diketene
124-40-3	Dimethylamine

CAS No.[a]	Chemical
121-69-7	N,N-Dimethylaniline
115-10-6	N,N-Dimethyl ether
68-12-2	N,N-Dimethylformamide
57-14-7	Dimethylhydrazine
77-78-1	Dimethyl sulfate
75-18-3	Dimethyl sulfide
67-68-5	Dimethyl sulfoxide
120-61-6	Dimethyl terephthalate
99-34-3	3,5-Dinitrobenzoic acid
51-28-5	Dinitrophenol
25321-14-6	Dinitrotoluene
123-91-1	Dioxane
646-06-0	Dioxilane
122-39-4	Diphenylamine
101-84-8	Diphenyl oxide
102-08-9	Diphenyl thiourea
25265-71-8	Dipropylene glycol
25378-22-7	Dodecene
28675-17-4	Diodecylaniline
27193-86-8	Dodecylphenol
106-89-8	Epichlorohydrin
64-17-5	Ethanol
141-43-5[c]	Ethalolamines
141-78-6	Ethyl acetate
141-97-9	Ethyl acetoacetate
140-88-5	Ethyl acrylate
75-04-7	Ethylamine
100-41-4	Ethylbenzene
74-96-4	Ethyl bromide
9004-57-3	Ethylcellulose
75-00-3	Ethyl chloride
105-39-5	Ethyl chloroacetate
105-56-6	Ethylcyanoacetate
74-85-1	Ethylene
96-49-1	Ethylene carbonate
107-07-3	Ethylene chlorohydrin
107-15-3	Ethylenediamine
106-93-4	Ethylene dibromide
107-21-1	Ethylene glycol
111-55-7	Ethylene glycol diacetate
110-71-4	Ethylene glycol dimethyl ether
111-76-2	Ethylene glycol monobutyl ether
112-07-2	Ethylene glycol monobutyl ether acetate
110-80-5	Ethylene glycol monoethyl ether
111-15-9	Ethylene glycol monoethyl ether acetate
109-86-4	Ethylene glycol monomethyl ether
110-49-6	Ethylene glycol monomethyl ether acetate
122-99-6	Ethylene glycol monophenyl ether
2807-30-9	Ethylene glycol monopropyl ether
75-21-8	Ethylene oxide
60-29-7	Ethyl ether
104-76-7	2-Ethylhexanol
122-51-0	Ethyl orthoformate
95-92-1	Ethyl oxalate
41892-71-1	Ethyl sodium oxalacetate
50-00-0	Formaldehyde
75-12-7	Formamide
64-18-6	Formic acid
110-17-8	Fumaric acid
98-01-1	Furfural
56-81-5	Glycerol
26545-73-7	Glycerol dichlorohydrin

CAS No.[a]	Chemical
25791-96-2	Glycerol triether
56-40-6	Glycine
107-22-2	Glyoxal
118-74-1	Hexachlorobenzene
67-72-1	Hexachloroethane
36653-82-4	Hexadecyl alcohol
124-09-4	Hexamethylenediamine
629-11-8	Hexamethylene glycol
100-97-0	Hexamethylenetetramine
74-90-8	Hydrogen cyanide
123-31-9	Hydroquinone
99-96-7	p-Hydroxybenzoic acid
26760-64-5	~~Iisoamylene~~ Isoamylene
76-83-1	Isobutanol
110-19-0	Isobutyl acetate
115-11-7	Isobutylene
78-84-2	Isobutyraldehyde
79-31-2	Isobutyric acid
25339-17-7	Isodecanol
26952-21-6	Isooctyl alcohol
78-78-4	Isopentane
78-59-1	Isophorone
121-91-5	Isophthalic acid
78-79-5	Isoprene
67-63-0	Isopropanol
108-21-4	Isopropyl acetate
75-31-0	Isopropylamine
75-29-6	Isopropyl chloride
25168-06-3	Isopropylphenol
463-51-4	Ketene
(b)	Linear alkyl sulfonate
123-01-3	Linear alkylbenzene (Linear dodecylbenzene)
110-16-7	Maleic acid
108-31-6	Maleic anhydride
6915-15-7	Malic acid
141-79-7	Mesityl oxide
121-47-1	Metanilic acid
79-41-4	Methacrylic acid
563-47-3	Methallyl chloride
67-56-1	Methanol
79-20-9	Methyl acetate
105-45-3	Methyl acetoacetate
74-89-5	Methylamine
100-61-8	n-Methylaniline
74-83-9	Methyl bromide
37365-71-2	Methyl butynol
74-87-3	Methyl chloride
108-87-2	Methylcyclohexane
1331-22-2	Methylcyclohexanone
75-09-2	Methylene chloride
101-77-9	Methylene dianiline
101-68-8	Methylene diphenyl diisocyanate
78-93-3	Methyl ethyl ketone
107-31-3	Methyl formate
108-11-2	Methyl isobutyl carbinol
108-10-1	Methyl isobutyl ketone
80-62-6	Methyl methacrylate
77-75-8	Methylpentynol
98-83-9	~~a-Methylstyrene~~ α-Methyl styrene
110-91-8	Morpholine
85-47-2	~~a~~ α-Naphthalene sulfonic acid
120-18-3	~~b~~ β-Naphthalene sulfonic acid
90-15-3	~~a~~ α-Naphthol
135-19-3	~~b~~ β-Naphthol

CAS No.[a]	Chemical
75-98-9	Neopentanoic acid
88-74-4	o-Nitroaniline
100-01-6	p-Nitroaniline
91-23-6	o-Nitroanisole
100-17-4	p-Nitroanisole
98-95-3	Nitrobenzene
27178-83-2[c]	Nitrobenzoic acid (o, m, and p)
79-24-3	Nitroethane
75-52-5	Nitromethane
88-75-5	2-Nitrophenol
25322-01-4	Nitropropane
1321-12-6	Nitrotoluene
27215-95-8	Nonene
25154-52-3	Nonylphenol
27193-28-8	Octylphenol
123-63-7	Paraldehyde
115-77-5	Pentaerythritol
109-66-0	n-Pentane
109-67-1	1-Pentene
127-18-4	Perchloroethylene
594-42-3	Perchloromethyl mercaptan
94-70-2	o-Phenetidine
156-43-4	p-Phenetidine
108-95-2	Phenol
98-67-9, 585-38-6, 609-46-1, 1333-39-7[c]	Phenolsulfonic acids
91-40-7	Phenyl anthranilic acid
(b)	Phenylenediamine
75-44-5	Phosgene
85-44-9	Phthalic anhydride
85-41-6	Phthalimide
108-99-6	b-Picoline
110-85-0	Piperazine
9003-29-6, 25036-29-7[c]	Polybutenes
25322-68-3	Polyethylene glycol
25322-69-4	Polypropylene glycol
123-38-6	Propionaldehyde
79-09-4	Propionic acid
71-23-8	n-Propyl alcohol
107-10-8	Propylamine
540-54-5	Propyl chloride
115-07-1	Propylene
127-00-4	Propylene chlorohydrin
78-87-5	Propylene dichloride
57-55-6	Propylene glycol
75-56-9	Propylene oxide
110-86-1	Pyridine
106-51-4	Quinone
108-46-3	Resorcinol
27138-57-4	Resorcylic acid
69-72-7	Salicylic acid
127-09-3	Sodium acetate
532-32-1	Sodium benzoate
9004-32-4	Sodium carboxymethyl cellulose
3926-62-3	Sodium chloroacetate
141-53-7	Sodium formate
139-02-6	Sodium phenate
110-44-1	Sorbic acid
100-42-5	Styrene
110-15-6	Succinic acid
110-61-2	Succinonitrile
121-57-3	Sulfanilic acid

CAS No.[a]	Chemical
126-33-0	Sulfolane
1401-55-4	Tannic acid
100-21-0	Terephthalic acid
79-34-5[c]	Tetrachloroethanes
117-08-8	Tetrachlorophthalic anhydride
78-00-2	Tetraethyl lead
119-64-2	Tetrahydronaphthalene
85-43-8	Tetrahydrophthalic anhydride
75-74-1	Tetramethyl lead
110-60-1	Tetramethylenediamine
110-18-9	Tetramethylethylenediamine
108-88-3	Toluene
95-80-7	Toluene-2,3-diamine
584-84-9	Toluene-2,4"diisocyanate
26471-62-5	Toluene diisocyanates (mixture)
1333-07-9	Toluenesulfonamide
104-15-4[c]	Toluenesulfonic acids
98-59-9	Toluenesulfonyl chloride
26915-12-8	Toluidines
87-61-6, 108-70-3, 120-82-1[c]	Trichlorobenzenes
71-55-6	1,1,1-Trichloroethane
79-00-5	1,1,2-Trichloroethane
79-01-6	Trichloroethylene
75-69-4	Trichlorofluoromethane
96-18-4	1,2,3-Trichloropropane
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane
121-44-8	Triethylamine
112-27-6	Triethylene glycol
112-49-2	Triethylene glycol dimethyl ether
7756-94-7	Triisobutylene
75-50-3	Trimethylamine
57-13-6	Urea
108-05-4	Vinyl acetate
75-01-4	Vinyl chloride
75-35-4	Vinylidene chloride
25013-15-4	Vinyl toluene
1330-20-7	Xylenes (mixed)
95-47-6	o-Xylene
106-42-3	p-Xylene
1300-71-6	Xylenol
1300-73-8	Xylidine

---

[a] CAS numbers refer to the Chemical Abstracts Registry numbers assigned to specific chemicals, isomers, or mixtures of chemicals. Some isomers or mixtures that are covered by the standards do not have CAS numbers assigned to them. The standards apply to all of the chemicals listed, whether CAS numbers have been assigned or not.

[b] No CAS number(s) have been assigned to this chemical, its isomers, or mixtures containing these chemicals.

[c] CAS numbers for some of the isomers are listed; the standards apply to all of the isomers and ~~mixture~~ mixtures, even if CAS numbers have not been assigned.

SECTION 151. NR 440.63(6)(b) is repealed and recreated to read:

NR 440.63(6)(b) Following the initial performance test, each owner or operator shall identify, record and submit quarterly reports to the department of each instance in which the volume-weighted average of the total mass of VOC per volume of coating solids, after the control device, if capture devices and control systems are used, is greater than the limit specified under sub. (3). If no instances occur during a particular quarter, a report stating this shall be submitted to the department semiannually.

SECTION 152. NR 440.63(6)(c) is renumbered NR 440.63(6)(d).

SECTION 153. NR 440.63(6)(c) is created to read:

NR 440.63(6)(c) Following the initial performance test, the owner or operator of an affected facility shall identify, record and submit at the frequency specified in s. NR 440.07(3) the following:

1. Where compliance with sub. (3) is achieved through the use of thermal incineration, each 3-hour period when cans are processed, during which the average temperature of the device was more than 28°C below the average

temperature of the device during the most recent performance test at which destruction efficiency was determined as specified under sub. (4).

2. Where compliance with sub. (3) is achieved through the use of catalytic incineration, each 3-hour period when cans are being processed, during which the average temperature of the device immediately before the catalyst bed is more than 28°C below the average temperature of the device immediately before the catalyst bed during the most recent performance test at which destruction efficiency was determined as specified under sub. (4) and all 3-hour periods, when cans are being processed, during which the average temperature difference across the catalyst bed is less than 80% of the average temperature difference across the catalyst bed during the most recent performance test at which destruction efficiency was determined as specified under sub. (5).

3. For thermal and catalytic incinerators, if no periods as described in subds. 1 and 2 occur, the owner or operator shall state this in the report.

SECTION 154. NR 440.64(3)(h) is amended to read:

NR 440.64(3)(h) The vapor collection and liquid loading equipment shall be designed and operated to prevent gauge pressure in the delivery tank from exceeding 4,500 pascals (450 mm of water) during product loading. This level is not to be exceeded when measured by the procedures specified in sub. ~~(4)(b)~~ (4)(d).

SECTION 155. NR 440.64(4) is repealed and recreated to read:

NR 440.64(4) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2). The 3-run requirement of s. NR 440.08(6) does not apply to this section.

(b) Immediately before the performance test required to determine compliance with sub. (3)(b), (c) and (h), the owner or operator shall use Method 21 to monitor for leakage of vapor all potential sources in the terminal's vapor collection system equipment while a gasoline tank truck is being loaded. The owner or operator shall repair all leaks with readings of 10,000 ppm (as methane) or greater before conducting the performance test.

(c) The owner or operator shall determine compliance with the standards in sub. (3)(b) and (c) as follows:

1. The performance test shall be 6 hours long during which at least 300,000 liters of gasoline is loaded. If this is not possible, the test may be continued the same day until 300,000 liters of gasoline is loaded or the test may be resumed the next day with another complete 6-hour period. In the latter case, the 300,000-liter criterion need not be met. However, as much as possible, testing should be conducted during the 6-hour period in which the highest throughput normally occurs.

2. If the vapor processing system is intermittent in operation, the performance test shall begin at a reference vapor holder level and shall end at the same reference point. The test shall include at least two startups and shutdowns of the vapor processor. If this does not occur under automatically controlled operations, the system shall be manually controlled.

3. The emission rate (E) of total organic compounds shall be computed using the following equation:

$$E = K \sum_{i=1}^{n} (V_{esi}\ C_{ei})/(L\ 10^{6})$$

where:

E is the emission rate of total organic compounds, mg/liter of gasoline loaded

V_{esi} is the volume of air-vapor mixture exhausted at each interval "i", scm

C_{ei} is the concentration of total organic compounds at each interval "i", ppm

L is the total volume of gasoline loaded, liters

n is the number of testing interval

i is the emission testing interval of 5 minutes

K is the density of calibration gas, 1.83×10^{6} for propane and 2.41×10^{6} for butane, mg/scm

4. The performance test shall be conducted in intervals of 5 minutes. For each interval "i", readings from each measurement shall be recorded, and the volume exhausted (V_{esi}) and the corresponding average total organic compounds concentration (C_{ei}) shall be determined. The sampling system

response time shall be considered in determining the average total organic compounds concentration corresponding to the volume exhausted.

5. The following methods shall be used to determine the volume (V_{esi}) air-vapor mixture exhausted at each interval:

a. Method 2B shall be used for combustion vapor processing systems.

b. Method 2A shall be used for all other vapor processing systems.

6. Method 25A or 25B shall be used for determining the total organic compounds concentration (C_{ei}) at each interval. The calibration gas shall be either propane or butane. The owner or operator may exclude the methane and ethane content in the exhaust vent by any method, for example, Method 18, approved by the department.

7. To determine the volume (L) of gasoline dispensed during the performance test period at all loading racks whose vapor emissions are controlled by the processing system being tested, terminal records or readings from gasoline dispensing meters at each loading rack shall be used.

(d) The owner or operator shall determine compliance with the standard in sub. (3)(h) as follows:

1. A pressure measurement device, liquid manometer, magnehelic gauge or equivalent instrument, capable of measuring up to 500 mm of water gauge pressure with ±2.5 mm of water precision, shall be calibrated and installed on the terminal's vapor collection system at a pressure tap located as close as possible to the connection with the gasoline tank truck.

2. During the performance test, the pressure shall be recorded every 5 minutes while a gasoline truck is being loaded; the highest instantaneous pressure that occurs during each loading shall also be recorded. Every loading position shall be tested at least once during the performance test.

SECTION 156. NR 440.64(7)(b) is amended to read:

NR 440.64(7)(b) Under s. NR 440.15, the "fixed capital cost of the new components" includes the fixed capital cost of all depreciable components, except components specified in par. (a), which are or will be replaced pursuant to all continuous programs of component replacement which are commenced within <u>any</u> 2-year period following December 17, 1980. For purposes of this paragraph "commenced" means that an owner or operator has undertaken a continuous program of component replacement or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of component replacement.

SECTION 157. NR 440.642(3)(b)1.a., (4)(h)3.c. and (7)(i)4.b. are amended to read:

NR 440.642(3)(b)1.a. At burn rates less than or equal to 2.82 kg/hr,

$C = 3.55 \text{ g/kg} \times BR + 4.98 \text{ g/hr}$,

where BR = is the burn rate in kg/hr

(4)(h)3.c. Test results not obtained under pressurized conditions may be adjusted for altitude according to the following formula:

$$E_A = \frac{E}{AAF}$$

where:

E_A = is the adjusted emissions in g/hr

E = is the measured emissions in g/hr at ALT_L

AAF = is the altitude adjustment factor where

$$AAF = \frac{ALT_L - 300}{6,600} + 1.0$$

ALT_L = is the altitude above mean sea level of laboratory in feet

(7)(i)4.b. If the manufacturer elects to use the estimated efficiency as provided in par. (i)3, the manufacturer shall estimate the heat output of the model as follows:

$$HO_E = (19.140) \times (\text{Estimated overall efficiency}/100) \times BR$$

where:

HO_E ~~— Estimated~~ is the estimated heat output in Btu/hr

BR ~~— Burn~~ is the burn rate in dry kilograms of test fuel per hour

SECTION 158. NR 440.644(1)(a) and (b) are repealed and recreated to read:

NR 440.644(1)(a) The provisions of this section, except as provided in par. (b), apply to each of the following affected facilities in rubber tire manufacturing plants that commence construction, modification, or reconstruction after January 20, 1983: each undertread cementing operation, each sidewall cementing operation, each tread end cementing operation, each bead cementing operation, each green tire spraying operation, each Michelin-A, each Michelin-B operation and each Michelin-C automatic operation.

(b) The owner or operator of each undertread cementing operation and each sidewall cementing operation in rubber tire manufacturing plants that commenced construction, modification or reconstruction after January 20, 1983, and on or before September 15, 1987, may comply with the alternate provisions in sub. (3)(b). This election shall be irreversible. The alternate provisions in sub. (3)(b) do not apply to any undertread cementing operation or sidewall cementing operation that is modified or reconstructed after September 15, 1987. The affected facilities in this paragraph are subject to all applicable provisions of this section.

SECTION 159. NR 440.644(3)(a) (title) and (b) are created to read:

NR 440.644(3)(a) (title) General.

(b) Alternate standard. 1. On and after the date on which the initial performance test, required by s. NR 440.08, is completed, but no later than 180 days after September 19, 1989, no owner or operator subject to the provisions in sub. (1)(b) may cause to be discharged into the atmosphere more than 25 grams of VOC per tire processed for each month if the operation uses 25 grams or less of VOC per tire processed and does not employ a VOC emission reduction system.

SECTION 160. NR 440.644(4)(b)1. and 2. are amended to read:

NR 440.644(4)(b)1. The owner or operator of an affected facility shall conduct an initial performance test, as required under s. NR 440.08(1), except as described under par. (j). The owner or operator of an affected facility shall thereafter conduct a performance test each month except as described under pars. (b)4. (g)1 and (j). Initial and monthly performance tests shall be conducted according to the procedures in this subsection.

2. The owner or operator of an affected facility who elects to use a VOC emission reduction system with a control device that destroys VOC, for example, incinerator, as described under pars. (f) and (g), shall repeat the performance test when directed by the department or when the owner or operator elects to operate the capture system or control device at conditions different from the most recent determination of overall reduction efficiency. The performance test shall be conducted in accordance with the procedures described under par. (f)2 a to ~~e.~~ d.

SECTION 161. NR 440.644(4)(b)4. is created to read:

NR 440.644(4)(b)4. The owner or operator of each tread end cementing operation and each green tire spraying operation using only water-based sprays (inside and outside or both) containing less than 1.0% by weight of VOC is not required to conduct a monthly performance test as described in par. (d). In lieu of conducting a monthly performance test, the owner or operator of each tread end cementing operation and each green tire spraying operation shall submit formulation data or the results of Method 24 analysis annually to verify the VOC content of each tread end cement and each green tire spray material, provided the spraying formulation has not changed during the previous 12 months. If the spray material formulation changes, formulation data or Method 24 analysis of the new spray shall be conducted to determine the VOC content of the spray and reported within 30 days as required under sub. (7)(j).

SECTION 162. NR 440.644(4)(d)(intro.) and (f)2.(intro.) are amended to read:

NR 440.644(4)(d)(intro.) For each tread end cementing operation and each green tire spraying operation where water-based cements or sprays ~~are used~~ containing 1.0%, by weight, of VOC or more are used (inside, ~~or~~ outside, or both) that do not use a VOC emission reduction system, the owner or operator shall use the following procedure to determine compliance with the g/tire limit specified under sub. (3)(a)3, 5 a and b, and 7 a and b.

(f)2.(intro.) Calculate the mass of VOC emitted per tire cemented at the affected facility for the month (N) or mass of VOC emitted per bead cemented for the affected facility for the month (N_b):

$$N = G(1 - R)$$

$$N_b = G_b(1 - R)$$

For the initial performance test, the overall reduction efficiency (R) shall be determined as prescribed under par. (f)2 a to ~~e.~~ d. ~~In subsequent months, the owner or operator may use the most recently determined overall reduction efficiency (R) for the performance test except during conditions described under par. (b)2.~~ After the initial performance test, the owner or operator may use the most recently determined overall reduction efficiency (R) for the performance test. No monthly performance tests are required. The performance test shall be repeated during conditions described under par. (b)2.

SECTION 163. NR 440.644(4)(f)2.d. is created to read:

NR 440.644(4)(f)2.d. The owner or operator of an affected facility may substitute the following procedure as an acceptable alternative to the requirements prescribed under par. (f)2 a. This alternative procedure is acceptable only in cases where a single VOC is used and is present in the capture system. The average capture efficiency value derived from a minimum of 3 runs shall constitute a test.

1) For each run, "i", measure the mass of the material containing a single VOC used. This measurement shall be made using a scale that has both a calibration and a readability to within 1% of the mass used during the run. This measurement may be made by filling the direct supply reservoir, for example, trough, tray, or drum that is integral to the operation, and related application equipment, for example, rollers, pumps, hoses, to a marked level at the start of the run and then refilling to the same mark from a more easily weighed container, for example, a separate supply drum, at the end of the run. The change in mass of the supply drum would equal the mass of material used from the direct supply reservoir. Alternatively, this measurement may be made by weighing the direct supply reservoir at the start and end of the run or by weighing the direct supply reservoir and related application equipment at the start and end of the run. The change in mass would equal the mass of the material used in the run. If only the direct supply reservoir is weighed, the amount of material in or on the related application equipment shall be the same at the start and end of the run. All additions of VOC containing material made to the direct supply reservoir during a run shall be properly accounted for in determining the mass of material used during that run.

2) For each run, "i", measure the mass of the material containing a single VOC which is present in the direct supply reservoir and related application equipment at the start of the run, unless the ending weight fraction VOC in the material is greater than or equal to 98.5% of the starting weight fraction VOC in the material, in which case, this measurement is not required. This measurement may be made directly by emptying the direct supply reservoir and related application equipment and then filling them to a marked level from an easily weighed container, for example, a separate supply drum.

The change in mass of the supply drum would equal the mass of material in the filled direct supply reservoir and related application equipment. Alternatively, this measurement may be made by weighing the direct supply reservoir and related application equipment at the start of the run and subtracting the mass of the empty direct supply reservoir and related application equipment (tare weight).

3) For each run, "i", the starting weight fraction VOC in the material shall be determined by Method 24 analysis of a sample taken from the direct supply reservoir at the beginning of the run.

4) For each run, "i", the ending weight fraction VOC in the material shall be determined by Method 24 analysis of a sample taken from the direct supply reservoir at the end of the run.

5) For each run, "i", in which the ending weight fraction VOC in the material is greater than or equal to 98.5% of the starting weight fraction VOC in the material, calculate the mass of the single VOC used (M_i) by multiplying the mass of the material used in the run by the starting weight fraction VOC of the material used in the run.

6) For each run, "i", in which the ending weight fraction VOC in the material is less than 98.5% of the starting weight fraction VOC in the material, calculate the mass of the single VOC used (M_i) as follows:

a) Calculate the mass of VOC present in the direct supply reservoir and related application equipment at the start of the run by multiplying the mass of material in the direct supply reservoir and related application equipment at the start of the run by the starting weight fraction VOC in the material for that run.

b) Calculate the mass of VOC present in the direct supply reservoir and related application equipment at the end of the run by multiplying the mass of material in the direct supply reservoir and related application equipment at the end of the run by the ending weight fraction VOC in the material for that run. The mass of material in the direct supply reservoir and related application equipment at the end of the run shall be calculated by subtracting the mass of material used in the run from the mass of material in the direct supply reservoir and related application equipment at the start of the run.

c) The mass of the single VOC used (M_1) equals the mass of VOC present in the direct supply reservoir and related application equipment at the start of the run minus the mass of VOC present in the direct supply reservoir and related application equipment at the end of the run.

7) If Method 25A is used to determine the concentration of the single VOC in the capture system, then calculate the capture efficiency (FC_i) for each run, "i", as follows:

$$FC_i = \frac{C_i \frac{W}{V} Q_i}{(M_i)\ (10^6)}$$

where:

C_i is the average concentration of the single VOC in the capture system during run "i" (parts per million by volume) corrected for background VOC

Note: See sub. (8)(a)5.

W is the molecular weight of the single VOC, expressed as mg per mg-mole

V is 2.405 × 10^{-5} m^3/mg-mole, the volume occupied by one mg-mole of ideal gas at standard conditions (20°C, 1 atmosphere) on a wet basis

Q_i is the volumetric flow in m^3 in the capture system during run "i" adjusted to standard conditions (20°C, 1 atmosphere) on a wet basis

Note: See sub. (8)(a)5.

10^6 is the ppm per unity

M_i is the mass in mg of the single VOC used during run "i"

8) If Method 25 is used to determine the concentration of the single VOC in the capture system, then calculate the capture efficiency (FC_i) for each run, "i", as follows:

$$FC_i = \frac{\frac{C_i}{(NC)(10^6)} \frac{(W)}{(V)} (Q_i)}{M_i}$$

where:

C_i is the average concentration of the single VOC in the capture system during run "i" (parts per million, as carbon, by volume) corrected for background VOC

Note: See sub. (8)(a)5.

W is the molecular weight of the single VOC, expressed as mg per mg-mole

V is 2.405 × 10^{-5} m^3/mg-mole, the volume occupied by one mg-mole of ideal gas at standard conditions (20°C, 1 atmosphere) on a wet basis

Q_i is the volumetric flow in m^3 in the capture system during run "i" adjusted to standard conditions (20°C, 1 atmosphere) on a dry basis

Note: See sub. (8)(a)5.

10^6 is the ppm per unity

M_i is the mass in mg of the single VOC used during run "i"

NC is the number of carbon atoms in one molecule of the single VOC

9) Calculate the average capture efficiency value, F_c as follows:

$$F_c = \frac{\sum_{i=1}^{n} FC_i}{n}$$

where:

"n" equals the number of runs made in the test (n > 3). In cases where an alternative procedure in this paragraph is used, the requirements in par. (f)2 b and c remain unchanged.

SECTION 164. NR 440.644(4)(j)(intro.) and 1. are amended to read:

NR 440.644(4)(j)(intro.) Rather than seeking to demonstrate compliance with the provisions of sub. (3)(a)1 a, 2 a, 6 a, 7 c or 9 a using the performance test procedures described under pars. (g) and (i), an owner or operator of an undertread cementing operation, sidewall cementing operation, green tire spraying operation where organic solvent-based sprays are used, or Michelin-B operation that use a VOC emission reduction system, may seek to demonstrate compliance by meeting the equipment design and performance specifications listed under ~~par. (j)~~ subds. 1, 2, and 4 to 6 or under ~~par. (j)~~ subds. 1 and 3 to 6 and by conducting a control device efficiency performance test to determine compliance as describe under ~~par. (j)~~ subd. 7. The owner or operator shall conduct this performance test of the control device efficiency no later than 180 days after initial startup of the affected facility, as specified under s. NR 440.08(1). Meeting the capture system design and performance specifications, in conjunction with operating a 95% efficient control device, is an acceptable means of demonstrating compliance with the standard. Therefore, the requirement for the initial performance test on the enclosure, as specified under s. NR 440.08(1), is waived. No monthly performance tests are required.

1. For each undertread cementing operation, each sidewall cementing operation, and each Michelin-B operation, the cement application and drying area shall be contained in an enclosure that meets the criteria specified under ~~par. (j)~~ subds. 2, 4 and 5. For each green tire spraying operation where organic solvent-based sprays are used, the spray application and drying area shall be contained in an enclosure that meets the criteria specified under ~~par. (j)~~ subds. 3, 4 and 5.

SECTION 164A. NR 440.644(4)(n) is created to read:

NR 440.644(4)(n) For each undertread cementing operation and each sidewall cementing operation that does not use a VOC emission reduction system, the owner or operator shall use the following procedure to determine compliance with the 25 g/tire limit specified in sub. (3)(b):

1. Calculate the total mass of VOC (M_o) used at the affected facility for the month by the following procedure.

a. For each affected facility for which cement is delivered in batch or via a distribution system which serves only that affected facility:

$$M_o = \sum_{i=1}^{n} L_{ci}D_{ci}W_{oi}$$

where:

"n" equals the number of different cements or sprays used during the month

b. For each affected facility for which cement is delivered via a common distribution system which also serves other affected or existing facilities:

1) Calculate the total mass (M) of VOC used for all of the facilities served by the common distribution system for the month:

$$M = \sum_{i=1}^{n} L_{ci}D_{ci}W_{oi}$$

where:

"n" equals the number of different cements or sprays used during the month

2) Determine the fraction (F_o) of "M" used by the affected facility by comparing the production records and process specifications for the material

cemented at the affected facility for the month to the production records and process specifications for the material cemented at all other facilities served by the common distribution system for the month or by another procedure acceptable to the department.

3) Calculate the total monthly mass of VOC (M_o) used at the affected facility:

$$M_o - MF_o$$

2. Determine the total number of tires (T_o) processed at the affected facility for the month by the following procedure:

a. For undertread cementing, T_o equals the number of tread or combined tread/sidewall components which receive an application of undertread cement.

b. For sidewall cementing, T_o equals the number of sidewall components which receive an application of sidewall cement, divided by 2.

3. Calculate the mass of VOC used per tire processed (G) by the affected facility for the month:

$$G - \frac{M_o}{T_o}$$

4. Calculate the mass of VOC emitted per tire processed (N) for the affected facility for the month:

$$N - G$$

5. Where the value of the mass of VOC emitted per tire processed (N) is less than or equal to the 25 g/tire limit specified under sub. (3)(b), the affected facility is in compliance.

SECTION 165. NR 440.644(6)(f), (7)(c)7., (i) and (j) and (8)(a)5. are created to read:

NR 440.644(6)(f) Each owner or operator of a tread end cementing operation and green tire spraying operation using water-based cements or sprays containing less than 1.0% by weight of VOC, as specified under sub.

(4)(b)4, shall maintain records of formulation data or the results of Method 24 analysis conducted to verify the VOC content of the spray.

(7)(c)7. For each affected facility that elects to comply with the alternate limit specified under sub. (3)(b): The mass VOC used (M_o), the number of tires processed (T_o), and the mass of VOC emitted per tire processed (N).

(i) The owner or operator of each undertread cementing operation and each sidewall cementing operation who qualifies for the alternate provisions as described in sub. (3)(b), shall furnish the department written notification of the election no less than 60 days after September 19, 1989.

(j) The owner or operator of each tread end cementing operation and each green tire spraying (inside, outside, or both) operation using water-based sprays containing less than 1.0%, by weight, of VOC as described in sub. (4)(b)1 shall furnish the department, within 60 days initially and annually thereafter, formulation data or Method 24 results to verify the VOC content of the water-based sprays in use. If the spray formulation changes before the end of the 12-month period, formulation data or Method 24 results to verify the VOC content of the spray shall be reported within 30 days.

(8)(a)5. Method 25 or Method 25A for determination of the VOC concentration in a capture system prior to a control device when only a single VOC is present, as described in sub. (4)(f)2 d 7) and 8). The owner or operator shall notify the department 30 days in advance of any test by either Method 25 or Method 25A. Method 1 shall be used to select the sampling site and the sampling point shall be the centroid of the duct or at a point no closer to the walls than 1 meter. Method 2, 2A, 2C or 2D, as appropriate, shall be used as the test method for the concurrent determination of gas flow rate in the capture system.

a. For Method 25, the sampling time for each run shall be at least 1 hour. For each run, a concurrent sample shall be taken immediately upwind of the application area to determine the background VOC concentration of air drawn into the capture system. Subtract this reading from the reading obtained in the capture system for that run. The minimum sample volume shall be 0.003 dscm except that shorter sampling times or smaller volumes, when necessitated by process variable or other factors, may be approved by the department. Use Method 3 to determine the moisture content of the stack gas.

b. For Method 25A, the sampling time for each run shall be at least 1 hour. Instrument calibration shall be performed by the procedure given in

Method 25A using the single VOC present in the capture system. A different calibration gas may be used if the results are corrected using an experimentally determined response factor comparing the alternative calibration gas to the single VOC used in the process. After the instrument has been calibrated, determine the background VOC concentration of the air drawn into the capture system immediately upwind of the application area for each run. The instrument does not need to recalibrated for the background measurement. Subtract this reading from the reading obtained in the capture system for that run. The Method 25A results shall only be used in the alternative procedure for determination of capture efficiency described under sub. (4)(f)2 d 7).

SECTION 166. NR 440.647 is created to read:

<u>NR 440.647 VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS FROM THE POLYMER MANUFACTURING INDUSTRY</u>. (1) APPLICABILITY AND DESIGNATION OF AFFECTED FACILITIES. (a) The provisions of this section apply to affected facilities involved in the manufacture of polypropylene, polyethylene, polystyrene, or poly(ethylene terephthalate) as defined in sub. (2). The affected facilities designated as follows for polypropylene and polyethylene are inclusive of all equipment used in the manufacture of these polymers, beginning with raw materials preparation and ending with product storage, and cover all emissions emanating from such equipment:

1. For process emissions from any polypropylene and polyethylene manufacturing process that uses a continuous process, the affected facilities are each of the following process sections: each raw materials preparation section, each polymerization reaction section, each material recovery section, each product finishing section and each product storage section. These process sections are affected facilities for process emissions that are emitted continuously and for process emissions that are emitted intermittently.

2. For process emissions from polystyrene manufacturing processes that use a continuous process, the affected facilities are each material recovery section. These process sections are affected facilities for only those process emissions that are emitted continuously.

3. For process emissions from poly(ethylene terephthalate) manufacturing processes that use a continuous process, the affected facilities are each polymerization reaction section. If the process uses dimethyl terephthalate,

then each material recovery section is also an affected facility. If the process uses terephthalic acid, then each raw materials preparation section is also an affected facility. These process sections are affected facilities for only those process emissions that are emitted continuously.

4. For VOC emissions from equipment leaks from polypropylene, polyethylene and polystyrene (including expandable polystyrene) manufacturing processes, the affected facilities are each group of fugitive emissions equipment, as defined in sub. (2), within any process unit, as defined in sub. (2). This section does not apply to VOC emissions from equipment leaks from polyethylene terephthalate manufacturing processes.

a. Affected facilities with a design capacity to produce less than 1,000 Mg/yr shall be exempt from sub. (4).

b. Addition or replacement of equipment for the purposes of improvement which is accomplished without a capital expenditure will not by itself be considered a modification under sub. (4)

(b) The applicability date identifies when an affected facility becomes subject to a standard. Usually, a standard has a single applicability date. However, some polypropylene and polyethylene affected facilities have a September 30, 1987, applicability date and others have a January 10, 1989, applicability date. The following paragraphs identify the applicability dates for all affected facilities subject to this section.

1. Polypropylene and polyethylene. Each process section in a polypropylene or polyethylene production process is a potential affected facility for both continuous and intermittent emissions. The applicability date depends on when the process section was constructed, modified or reconstructed and, in some instances, on the type of production process.

a. The applicability date for any polypropylene or polyethylene affected facility that is constructed, modified or reconstructed after January 10, 1989, regardless of the type of production process being used, is January 10, 1989.

b. Only some polypropylene or polyethylene process sections that are constructed, modified or reconstructed on or before January 10, 1989, but after September 30, 1987, are affected facilities. These process sections, and the type of emissions to be controlled, are identified by an "X" in Table 1. The applicability date for the process sections and the emissions to be controlled that are identified by an "X" in Table 1 is September 30, 1987. Since the affected facilities that have a September 30, 1987, applicability date are determined by the type of production process (for example, liquid phase, gas phase), each owner or operator shall identify the particular production process that applies to his or her particular process.

TABLE 1. POLYPROPYLENE AND POLYETHYLENE AFFECTED FACILITIES WITH SEPTEMBER 30, 1987, APPLICABILITY DATE

Polymer	Production Process	Process Section	Emissions Continuous	 Intermittent
Polypropylene	Liquid phase	Raw Materials Preparation	X	--
		Material Recovery	X	--
		Polymerization Reaction	X	X
		Product Finishing	X	--
		Product Storage	--	--
Polypropylene	Gas Phase	Raw Materials Preparation	--	--
		Polymerization Reaction	--	X
		Material Recovery	X	--
		Product Finishing	--	--
		Product Storage	--	--
Low Density Polyethylene	High Pressure	Raw Materials Preparation	--	X
		Polymerization Reaction	--	X
		Material Recovery	--	X
		Product Finishing	--	X
		Product Storage	--	X
Low Density Polyethylene	Low Pressure	Raw Materials Preparation	X	X
		Polymerization Reaction	--	X
		Material Recovery	--	--
High Density Polyethylene	Gas Phase	Product Finishing	X	--
		Product Storage	--	--
High Density Polyethylene	Liquid Phase Slurry	Raw Materials Preparation	--	X
		Polymerization Reaction	--	--
		Material Recovery	X	--
		Product Finishing	X	--
		Product Storage	--	--
High Density Polyethylene	Liquid Phase Solution	Raw Materials Preparation	X	X
		Polymerization Reaction	--	X
		Material Recovery	X	X
		Product Finishing	--	--
		Product Storage	--	--

NOTE: "X" denotes that process section is an affected facility for continuous or intermittent emissions or both, as shown, which has a September 30, 1987, applicability date.

"--" denotes that process section is not considered an affected facility for continuous or intermittent emissions or both, as shown, if the process section is constructed, modified, or reconstructed after September 30, 1987, and on or before January 10, 1989. These process sections are affected facilities if they are constructed, modified, or reconstructed after January 10, 1989.

2. Polystyrene. The applicability date for each polystyrene affected facility is September 30, 1987.

3. Poly(ethylene terephthalate). The applicability date for each poly(ethylene terephthalate) affected facility is September 30, 1987.

(c) Any facility under par. (a) that commences construction, modification or reconstruction after its applicability date as identified under par. (b) is subject to the requirements of this section, except as provided in par. (d) to (f).

(d) Any polypropylene or polyethylene affected facility with a September 30, 1987, applicability date that commenced construction, modification or reconstruction after September 30, 1987, and on or before January 10, 1989, with an uncontrolled emission rate, as defined in footnote a to Table 2, at or below those identified in Table 2 is not subject to the requirements of sub. (3) unless and until its uncontrolled emission rate exceeds that rate listed for it in Table 2 or it is modified or reconstructed after January 10, 1989. At such time, such facility becomes subject to sub. (3) and the procedures identified in sub. (3)(a) shall be used to determine the control of emissions from the facility.

TABLE 2. MAXIMUM UNCONTROLLED THRESHOLD EMISSION RATES[a]

Production Process	Process Section	Uncontrolled Emission Rate, kg TOC/Mg product
Polypropylene, liquid phase process	Raw Materials Preparation	0.15[b]
	Polymerization Reaction	0.14[b], 0.24[c]
	Material Recovery	0.19[b]
	Product Finishing	1.57[b]
Polypropylene, gas phase process	Polymerization Reaction	0.12[c]
	Material Recovery	0.02[b]
Low Density Polyethylene, high pressure process	Raw Materials Preparation	0.41[d]
	Polymerization Reaction	(e)
	Material Recovery	(e)
	Product Finishing	(e)
	Product Storage	(e)
Low Density Polyethylene, low pressure process	Raw Materials Preparation	0.05[f]
	Polymerization Reaction	0.03[g]
	Production Finishing	0.01[b]
High Density Polyethylene, liquid phase slurry process	Raw Materials Preparation	0.25[c]
	Material Recovery	0.11[b]
	Product Finishing	0.41[b]
High Density Polyethylene, liquid phase solution process	Raw Materials Preparation	0.24[f]
	Polymerization Reaction	0.16[c]
	Material Recovery	1.68[f]
High Density Polyethylene, gas phase process	Raw Materials Preparation	0.05[f]
	Polymerization Reaction	0.03[g]
	Product Finishing	0.01[b]
Polystyrene, continuous process	Material Recovery	0.05[b,h]
Poly(ethylene terephthalate), dimethyl terephthalate process	Material Recovery	0.12[b,h]
	Polymerization Reaction	1.80[h,i,j]
Poly(ethylene terephthalate), terephthalic acid process	Raw Materials Preparation	(l)
	Polymerization Reaction	1.80[h,j,m] 3.92[h,k,m]

TABLE 2. MAXIMUM UNCONTROLLED THRESHOLD EMISSION RATES[a] (continued)

FOOTNOTES

[a] "Uncontrolled emission rate" refers to the emission rate of a vent stream that vents directly to the atmosphere and to the emission rate of a vent stream to the atmosphere that would occur in the absence of any add-on control devices but after any material recovery devices that constitute part of the normal material recovery operations in a process line where potential emissions are recovered for recycle or resale.

[b] Emission rate applies to continuous emissions only.

[c] Emission rate applies to intermittent emissions only.

[d] Total emission rate for non-emergency intermittent emissions from raw materials preparation, polymerization reaction, material recovery, product finishing, and product storage process sections.

[e] See footnote d.

[f] Emission rate applies to both continuous and intermittent emissions.

[g] Emission rate applies to non-emergency intermittent emissions only.

[h] Applies to modified or reconstructed affected facilities only.

[i] Includes emissions from the cooling water tower.

[j] Applies to a process line producing low viscosity poly(ethylene terephthalate).

[k] Applies to a process line producing high viscosity poly(ethylene terephthalate).

[l] See footnote m.

[m] Applies to the sum of emissions to the atmosphere from the polymerization reaction section (including emissions from the cooling water tower) and the raw materials preparation section (i.e., the esterifiers).

(e)1. Modified or reconstructed affected facilities at polystyrene and poly(ethylene terephthalate) plants with uncontrolled emission rates at or below those identified in Table 2 are exempt from the requirements of sub. (3) unless and until its uncontrolled emission rate exceeds that rate listed for it in Table 2. This exemption does not apply to new polystyrene or poly(ethylene terephthalate) affected facilities.

2. Emissions from modified or reconstructed affected facilities that are controlled by an existing control device and that have uncontrolled emission rates greater than the uncontrolled threshold emission rates identified in Table 2 are exempt from the requirements of sub. (3) unless and until the existing control device is modified, reconstructed or replaced.

(f) No process section of an experimental process line is considered an affected facility for continuous or intermittent process emissions.

(g) Individual vent streams that emit continuous emissions with uncontrolled annual emissions of less than 1.6 Mg/yr or with a weight percent TOC of less than 0.10% from a new, modified or reconstructed polypropylene or polyethylene affected facility are exempt from the requirements of sub.

(3)(a)1. If at a later date, an individual stream's uncontrolled annual emissions become 1.6 Mg/yr or greater, if the stream was exempted on the basis of the uncontrolled annual emissions exemption, or VOC concentration becomes 0.10 weight percent or higher, if the stream was exempted on the basis of the VOC concentration exemption, then the stream is subject to the requirements of sub. (3).

(h) Emergency vent streams, as defined in sub. (2) from a new, modified or reconstructed polypropylene or polyethylene affected facility are exempt from the requirements of sub. (3)(a)2.

(i) An owner or operator of a polypropylene or polyethylene affected facility that commenced construction, modification or reconstruction after September 30, 1987, and on or before January 10, 1989, and that is in a process line in which more than one type of polyolefin, that is, polypropylene, low density polyethylene, high density polyethylene or their copolymers, is produced shall select one of the polymer/production process combinations in Table 1 for purposes of determining applicable affected facilities and uncontrolled threshold emission rates.

Note: The numerical emission limits in these standards are expressed in terms of total organic compounds, measured as total organic compounds less methane and ethane.

(2) DEFINITIONS. (a) As used in this section, all terms not defined shall have the meaning given them in s. NR 440.02 or in s. NR 440.62, and the following terms shall have the specific meanings given them.

1. "Boiler" means any enclosed combustion device that extracts useful energy in the form of steam.

2. "Capital expenditure" means, in addition to the definition in s. NR 440.02 an expenditure for a physical or operational change to an existing facility that exceeds P, the product of the facility's replacement cost, R, and an adjusted annual asset guideline repair allowance, A, as reflected by the following equation: $P = R \times A$, where:

a. The adjusted annual asset guideline repair allowance, A, is the product of the percent of the replacement cost, Y, and the applicable basic annual asset guideline repair allowance, B, as reflected by the following equation: $A = Y \times (B/100)$;

b. The percent Y is determined from the following equation:

$Y = 1.0 - 0.57 \log X$,

where X is 1986 minus the year of construction; and

c. The applicable basic annual asset guideline repair allowance, B, is equal to 12.5.

3. "Car-sealed" means, for purposes of these standards, a seal that is placed on the device used to change the position of a valve, for example, from opened to closed, such that the position of the valve cannot be changed without breaking the seal and requiring the replacement of the old seal once broken with a new seal.

4. "Closed vent system" means a system that is not open to the atmosphere and that is composed of piping, connections and, if necessary, flow inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.

5. "Continuous emissions" means any gas stream containing VOC that is generated essentially continuously when the process line or any piece of equipment in the process line is operating.

6. "Continuous process" means polymerization process in which reactants are introduced in a continuous manner and products are removed either continuously or intermittently at regular intervals so that the process can be operated and polymers produced essentially continuously.

7. "Control device" means an enclosed combustion device, vapor recovery system or flare.

8. "Copolymer" means a polymer that has 2 different repeat units in its chain.

9. "Decomposition" means, for the purposes of these standards, an event in a polymerization reactor that advances to the point where the polymerization reaction becomes uncontrollable, the polymer begins to break down (decompose), and it becomes necessary to relieve the reactor instantaneously in order to avoid catastrophic equipment damage or serious adverse personnel safety consequences.

10. "Decomposition emissions" refers to those emissions released from a polymer production process as the result of a decomposition or during attempts to prevent a decomposition.

11. "Emergency vent stream" means, for the purposes of these standards, an intermittent emission that results from a decomposition, attempts to prevent decompositions, power failure, equipment failure or other unexpected cause that requires immediate venting of gases from process equipment in order to avoid safety hazards or equipment damage. This includes intermittent vents that occur from process equipment where normal operating parameters, for

example, pressure or temperature, are exceeded such that the process equipment cannot be returned to normal operating conditions using the design features of the system and venting must occur to avoid equipment failure or adverse safety personnel consequences and to minimize adverse effects of the runaway reaction. This does not include intermittent vents that are designed into the process to maintain normal operating conditions of process vessels including those vents that regulate normal process vessel pressure.

12. "End finisher" means a polymerization reaction vessel operated under very low pressures, typically at pressures of 2 torr or less, in order to produce high viscosity poly(ethylene terephthalate). An end finisher is preceded in a high viscosity poly(ethylene terephthalate) process line by one or more polymerization vessels operated under less severe vacuums, typically between 5 and 10 torr. A high viscosity poly(ethylene terephthalate) process line may have one or more end finishers.

13. "Existing control device" means, for the purposes of these standards, an air pollution control device that has been in operation on or before September 30, 1987, or that has been in operation between September 30, 1987, and January 10, 1989, on those continuous or intermittent emissions from a process section that is marked by an "--" in Table 1 of this section.

14. "Existing control device is reconstructed" means, for the purposes of these standards, the capital expenditure of at least 50% of the replacement cost of the existing control device.

15. "Existing control device is replaced" means, for the purposes of these standards, the replacement of an existing control device with another control device.

16. "Expandable polystyrene" means a polystyrene bead to which a blowing agent has been added using either an in-situ suspension process or a post-impregnation suspension process.

17. "Experimental process line" means a polymer or copolymer manufacturing process line with the sole purpose of operating to evaluate polymer manufacturing processes, technologies or products. An experimental process line does not produce a polymer or resin that is sold or that is used as a raw material for nonexperimental process lines.

18. "Flame zone" means that portion of the combustion chamber in a boiler occupied by the flame envelope.

19. "Fugitive emissions equipment" means each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve and

flange or other connector in VOC service and any devices or systems required by s. NR 440.62.

20. "Gas phase process" means a polymerization process in which the polymerization reaction is carried out in the gas phase; that is, the monomers are gases in a fluidized bed of catalyst particles and granular polymer.

21. "High density polyethylene" or "HDPE" means a thermoplastic polymer or copolymer comprised of at least 50% ethylene by weight and having a density of greater than 0.940 g/cm^3.

22. "High pressure process" means the conventional production process for the manufacture of low density polyethylene in which a reaction pressure of about 15,000 psig or greater is used.

23. "High viscosity poly(ethylene terephthalate)" means poly(ethylene terephthalate) that has an intrinsic viscosity of 0.9 or higher and is used in such applications as tire cord and seat belts.

24. "Incinerator" means an enclosed combustion device that is used for destroying VOC.

25. "In-situ suspension process" means a manufacturing process in which styrene, blowing agent and other raw materials are added together within a reactor for the production of expandable polystyrene.

26. "Intermittent emissions" means those gas streams containing VOC that are generated at intervals during process line operation and includes both planned and emergency releases.

27. "Liquid phase process" means a polymerization process in which the polymerization reaction is carried out in the liquid phase; that is, the monomers and any catalyst are dissolved or suspended in a liquid solvent.

28. "Liquid phase slurry process" means a liquid phase polymerization process in which the monomers are in solution, completely dissolved, in a liquid solvent, but the polymer is in the form of solid particles suspended in the liquid reaction mixture during the polymerization reaction; sometimes called a particle form process.

29. "Liquid phase solution process" means a liquid phase polymerization process in which both the monomers and polymer are in solution, completely dissolved in the liquid reaction mixture.

30. "Low density polyethylene" or "LDPE" means a thermoplastic polymer or copolymer comprised of at least 50% ethylene by weight and having a density of 0.940 g/cm^3 or less.

31. "Low pressure process" means a production process for the manufacture of low density polyethylene in which a reaction pressure markedly below that used in a high pressure process is used. Reaction pressure of current low pressure processes typically go up to about 300 psig.

32. "Low viscosity poly(ethylene terephthalate)" means a poly(ethylene terephthalate) that has an intrinsic viscosity of less than 0.75 and is used in such applications as clothing, bottle and film production.

33. "Material recovery section" means the equipment that recovers unreacted or by-product materials from any process section for return to the process line, off-site purification, treatment or sale. Equipment designed to separate unreacted or by-product material from the polymer product are to be included in this process section, provided at least some of the material is recovered for reuse in the process, off-site purification or treatment, or sale, at the time the process section becomes an affected facility. Otherwise such equipment are to be assigned to one of the other process sections, as appropriate. Equipment that treats recovered materials are to be included in this process section, but equipment that also treats raw materials are not to be included in this process section. The latter equipment are to be included in the raw materials preparation section. If equipment is used to return unreacted or by-product material directly to the same piece of process equipment from which it was emitted, then that equipment is considered part of the process section that contains the process equipment. If equipment is used to recover unreacted or by-product material from a process section and return it to another process section or a different piece of process equipment in the same process section or sends it off-site for purification, treatment or sale, then such equipment are considered part of a material recovery section. Equipment used for the on-site recovery of ethylene glycol from poly(ethylene terephthalate) plants, however, are not included in the material recovery section, but are covered under the standards applicable to the polymerization reaction section as described in sub. (3)(c)1 b 1) or 2 b 1).

34. "Operating day" means, for the purposes of these standards, any calendar day during which equipment used in the manufacture of polymer was operating for at least 8 hours or one labor shift, whichever is shorter. Only operating days shall be used in determining compliance with the standards specified in sub. (3)(c)1 b 2), 3), 2 b 2) and 3). Any calendar day in which equipment is used for less than 8 hours or one labor shift, whichever is less, is not an "operating day" and may not be used as part of the rolling 14-day

period for determining compliance with the standards specified in sub. (3)(c)1 b 2), 3), 2 b 2) and 3).

35. "Polyethylene" means a thermoplastic polymer or copolymer comprised of at least 50% ethylene by weight.

Note: See low density polyethylene and high density polyethylene.

36. "Poly(ethylene terephthalate)" or "PET" means a polymer or copolymer comprised of at least 50% bis-(2-hydroxyethyl)-terephthalate (BHET) by weight.

37. "Poly(ethylene terephthalate) (PET) manufacture using dimethyl terephthalate" means the manufacturing of poly(ethylene terephthalate) based on the esterification of dimethyl terephthalate (DMT) with ethylene glycol to form the intermediate monomer bis-(2-hydroxyethyl)-terephthalate (BHET) that is subsequently polymerized to form PET.

38. "Poly(ethylene terephthalate) (PET) manufacture using terephthalic acid" means the manufacturing of poly(ethylene terephthalate) based on the esterification reaction of terephthalic acid (TPA) with ethylene glycol to form the intermediate monomer bis-(2-hydroxyethyl)-terephthalate (BHET) that is subsequently polymerized to form PET.

39. "Polymerization reaction section" means the equipment designed to cause monomers to react to form polymers, including equipment designed primarily to cause the formation of short polymer chains (oligomers or low polymers), but not including equipment designed to prepare raw materials for polymerization, for example, esterification vessels. For the purposes of these standards, the polymerization reaction section begins with the equipment used to transfer the materials from the raw materials preparation section and ends with the last vessel in which polymerization occurs. Equipment used for the on-site recovery of ethylene glycol from poly(ethylene terephthalate) plants, however, are included in this process section, rather than in the material recovery process section.

40. "Polypropylene" or "PP" means a thermoplastic polymer or copolymer comprised of at least 50% propylene by weight.

41. "Polystyrene" or "PS" means a thermoplastic polymer or copolymer comprised of at least 80% styrene or para-methylstyrene by weight.

42. "Post-impregnation suspension process" means a manufacturing process in which polystyrene beads are first formed in a suspension process, washed, dried or otherwise finished and then added with a blowing agent to another reactor in which the beads and blowing agent are reacted to produce expandable polystyrene.

43. "Process heater" means a device that transfers heat liberated by burning fuel to fluids contained in tubular coils, including all fluids except water that is heated to produce steam.

44. "Process line" means a group of equipment assembled that can operate independently if supplied with sufficient raw materials to produce polypropylene, polyethylene, polystyrene (general purpose, crystal or expandable) or poly(ethylene terephthalate) or one of their copolymers. A process line consists of the equipment in the following process sections, to the extent that these process sections are present at a plant: raw materials preparation, polymerization reaction, product finishing, product storage and material recovery.

45. "Process section" means the equipment designed to accomplish a general but well-defined task in polymer production. Process sections include raw materials preparation, polymerization reaction, material recovery, product finishing and product storage and may be dedicated to a single process line or common to more than one process line.

46. "Process unit" means equipment assembled to perform any of the physical and chemical operations in the production of polypropylene, polyethylene, polystyrene (general purpose, crystal or expandable) or poly(ethylene terephthalate) or one of their copolymers. A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product. Examples of process units are raw materials handling and monomer recovery.

47. "Product finishing section" means the equipment that treats, shapes or modifies the polymer or resin to produce the finished end product of the particular facility, including equipment that prepares the product for product finishing. For the purposes of these standards, the product finishing section begins with the equipment used to transfer the polymerized product from the polymerization reaction section and ends with the last piece of equipment that modifies the characteristics of the polymer. Product finishing equipment may accomplish product separation, extruding and pelletizing, cooling and drying, blending, additives introduction, curing or annealing. Equipment used to separate unreacted or by-product material from the product are to be included in this process section, provided the material separated from the polymer product is not recovered at the time the process section becomes an affected facility. If the material is being recovered, then the separation equipment are to be included in the material recovery

section. Product finishing does not include polymerization, the physical mixing of the pellets to obtain a homogenous mixture of the polymer except as provided in this subdivision or the shaping, such as fiber spinning, molding or fabricating, or modification, such as fiber stretching and crimping, of the finished end product. If physical mixing occurs in equipment located between product finishing equipment, that is, before all the chemical and physical characteristics have been "set" by virtue of having passed through the last piece of equipment in the product finishing section, then the equipment is to be included in this process section. Equipment used to physically mix the finished product that is located after the last piece of equipment in the product finishing section is part of the product storage section.

48. "Product storage section" means the equipment that is designed to store the finished polymer or resin end product of the particular facility. For the purposes of these standards, the product storage section begins with the equipment used to transfer the finished product out of the product finishing section and ends with the containers used to store the final product. Any equipment used after the product finishing section to recover unreacted or by-product material are to be considered part of a material recovery section. Product storage does not include any intentional modification of the characteristics of any polymer or resin product, but does include equipment that provides a uniform mixture of product, provided the equipment is used after the last product finishing piece of equipment. This process section also does not include the shipment of a finished polymer or resin product to another facility for further finishing or fabrication.

49. "Raw materials preparation section" means the equipment located at a polymer manufacturing plant designed to prepare raw materials, such as monomers and solvents, for polymerization. For the purposes of these standards, this process section begins with the equipment used to transfer raw materials from storage and recovered material from material recovery process sections, and ends with the last piece of equipment that prepares the material for polymerization. The raw materials preparation section may include equipment that accomplishes purification, drying or other treatment of raw materials or of raw and recovered materials together, activation of catalysts, and esterification including the formation of some short polymer chains (oligomers), but does not include equipment that is designed primarily to accomplish the formation of oligomers, the treatment of recovered materials alone or the storage of raw materials.

50. "Recovery system" means an individual unit or series of material recovery units, such as absorbers, condensers and carbon adsorbers, used for recovering volatile organic compounds.

51. "Total organic compounds" or "TOC" means those compounds measured according to the procedures specified in sub. (6).

52. "Uncontrolled emission rate" means the emission rate of a vent stream that vents directly to the atmosphere and the emission rate of a vent stream to the atmosphere that would occur in the absence of any add-on control devices but after any material recovery devices that constitute part of the normal material recovery operations in a process line where potential emissions are recovered for recycle or resale.

53. "Vent stream" means any gas stream released to the atmosphere directly from an emission source or indirectly either through another piece of process equipment or a material recovery device that constitutes part of the normal recovery operations in a polymer process line where potential emissions are recovered for recycle or resale, and any gas stream directed to an air pollution control device. The emissions released from an air pollution control device are not considered a vent stream unless, as noted in this subdivision, the control device is part of the normal material recovery operations in a polymer process line where potential emissions are recovered for recycle or resale.

54. "Volatile organic compounds" or "VOC" means, for the purposes of these standards, any reactive organic compounds as defined in s. NR 440.02.

(3) STANDARDS: PROCESS EMISSIONS. (a) Each owner or operator of a polypropylene, low density polyethylene or high density polyethylene process line containing a process section subject to the provisions of this section shall comply with the provisions in this subsection on and after the date on which the initial performance test required by s. NR 440.08 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup, whichever comes first.

1. Continuous emissions. For each vent stream that emits continuous emissions from an affected facility as defined in sub. (1)(a)1, the owner or operator shall use the procedures identified in subpars. b and c for determining which continuous emissions are to be controlled and which level of control listed in subpar. a is to be met. The owner or operator shall use the

procedures identified in subpars. b and c each time a process section is constructed, modified or reconstructed at the plant site.

a. Level of control. Continuous emission streams determined to be subject to control pursuant to the procedures identified in subpars. b and c, as applicable, shall meet one of the control levels identified in subpar. a 1) to 4). The procedures in subpars. b and c identify which level of control may be met. The level of control identified in subpar. b 4) is limited to certain continuous emission streams, which are identified through the procedures in subpars. b and c.

1) Reduce emissions of total organic compounds (minus methane and ethane) (TOC) by 98 weight percent, or to a concentration of 20 parts per million by volume (ppmv) on a dry basis, whichever is less stringent. The TOC is expressed as the sum of the actual compounds, not carbon equivalents. If an owner or operator elects to comply with the 20 ppmv standard, the concentration shall include a correction to 3% oxygen only when supplemental combustion air is used to combust the vent stream.

2) Combust the emissions in a boiler or process heater with a design heat input capacity of 150 million Btu/hr or greater by introducing the vent stream into the flame zone of the boiler or process heater. If a boiler or process heater of lesser design heat capacity may be used, it shall demonstrate compliance with subpar. a 1).

3) Combust the emissions in a flare that meets the conditions specified in s. NR 440.18. If the flare is used to control both continuous and intermittent emissions, the flare shall meet the conditions specified in s. NR 440.18 at all times, that is, when controlling continuous emissions alone or when controlling both continuous and intermittent emissions.

4) Vent the emissions to a control device located on the plant site.

b. Uncontrolled continuous emissions. For each vent stream that emits continuous emissions from an affected facility as defined in sub. (1)(a)1 and that is not controlled in an existing control device, the owner or operator shall use the procedures identified in Table 3 to identify those continuous emissions from each constructed, modified or reconstructed affected facility that are to be controlled. The owner shall include in the procedure all uncontrolled continuous vent streams from previously constructed, modified, or reconstructed affected facilities at the plant site each time a process section is constructed, modified or reconstructed at the plant site. In applying the procedures shown in Table 3, the stream characteristics may be either measured or calculated as specified in sub. (6)(d). For modified or reconstructed affected facilities, these stream characteristics are to be determined after a modification or reconstruction determination has been made by the department, but before any actual changes have been undertaken, and then again after the actual changes have been made. Figure 1 provides a summary overview of the control determination procedure described in Table 3.

TABLE 3. PROCEDURE FOR DETERMINING CONTROL AND APPLICABLE STANDARD FOR CONTINUOUS EMISSION STREAMS FROM NEW, MODIFIED, OR RECONSTRUCTED POLYPROPYLENE AND POLYETHYLENE AFFECTED FACILITIES

Procedure[a]	Applicable TOC Weight Percent Range	Control/No Control Criteria	Applicable Standard
1. Sum all uncontrolled streams with TOC weight percent within the applicable weight percent range from all affected facilities at a plant site.	0.10 < 5.5	1. If total combined uncontrolled emissions are equal to or greater than the calculated threshold emissions (CTE)[b], control.	1. sub. (3)(a)1 a 1), 2) or 3)
2. Calculate total uncontrolled annual emissions for each weight percent range. For modified or affected facilities, use the total uncontrolled emissions after modification or reconstruction.		2. If total combined uncontrolled emission are less than the CTE[b], control only individual streams with volume flow rates of 8 scfm or less.	2. sub. (3)(a)1 a 1), through 4)
3. Calculate composite TOC concentration (weight percent) for streams in the 0.10 to less than 5.5 weight percent range and for streams in the 5.5 to less than 20 weight percent range. For modified or reconstructed affected facilities, calculate the composite VOC concentration before and after modification and reconstruction.	5.5 < 20	1. If total combined uncontrolled emissions are equal to or greater than CTE, control.	1. sub. (3)(a)1 a 1), 2) or 3)
		2. If total combined uncontrolled emissions are less than the CTE[b], control only individual streams with volume flow rates of 8 scfm or less.	2. sub. (3)(a)1 a 1), through 4)
4. Select the higher of the two TOC concentrations for each weight percent range for vent streams from a modified or reconstructed affected facility.	20 to 100	1. If total combined uncontrolled emissions are equal to or greater than 18.2 Mg/yr, control.	1. sub. (3)(a)1 a 1), 2) or 3)
5. Calculate the threshold emissions for the 0.10 to less than 5.5 weight percent range and for the 5.5 to less than 20 weight percent range using the respective composite TOC concentration selected above.		2. If total combined uncontrolled emissions are less than 18.2 Mg/yr, control.	2. sub. (3)(a)1 a 1), through 4)

TABLE 3. PROCEDURE FOR DETERMINING CONTROL AND APPLICABLE STANDARD FOR CONTINUOUS EMISSION STREAMS FROM NEW, MODIFIED, OR RECONSTRUCTED POLYPROPYLENE AND POLYETHYLENE AFFECTED FACILITIES (continued)

FOOTNOTES

[a] Individual streams excluded under sub. (1)(g) from the requirements of sub. (3) are to be excluded from all calculations in this table. This paragraph exempts all individual emission streams with individual uncontrolled annual emission rates of less than 1.6 Mg/yr and all individual emission streams with individual TOC concentrations of less than 0.10% TOC by weight.

[b] For the 0.10 to less than 5.5 weight percent range, the following equations are used:

If the percent composite TOC concentration is....	Use this equation to calculate threshold emissions...
$0.10 < 0.12$	$(a \times 7.5 \times 10^6) + 226$
$0.12 < 0.2$	$(b \times 58.3) + 116.8$
$0.2 < 0.3$	$(c \times 3020) + 71.8$
$0.3 < 0.4$	$(d \times 547) + 54.5$
$0.4 < 0.6$	$48.3 + 31\ (0.6 - \text{weight percent TOC})$
$0.6 < 5.5$	48.3

where:

$$a = (0.12 - \text{weight percent TOC})^{2.5}$$

$$b = \frac{\left[\dfrac{0.18}{\text{weight percent TOC}}\right]^{0.5} - 1}{\text{weight percent TOC}}$$

$$c = (0.3 - \text{weight percent TOC})^{2}$$

$$d = (0.4 - \text{weight percent TOC})^{1.5}$$

For the 5.5 to less than 20 weight percent range, the following equations are used.

If the percent composite TOC concentration is...	Use this equation to calculate threshold emissions...
$5.5 < 7.0$	$(e \times 740) + 31$
$7.0 < 9.0$	$(f \times 324) + 25.0$
$9.0 < 20$	$(g \times 125) + 18.2$

where:

$$e = \frac{\left[\dfrac{7.0}{\text{weight percent TOC}}\right]^{0.5} - 1}{\text{weight percent TOC}}$$

$$f = \frac{\left[\dfrac{9.0}{\text{weight percent TOC}}\right]^{0.5} - 1}{\text{weight percent TOC}}$$

$$g = \frac{\left[\dfrac{20.0}{\text{weight percent TOC}}\right]^{0.5} - 1}{\text{weight percent TOC}}$$

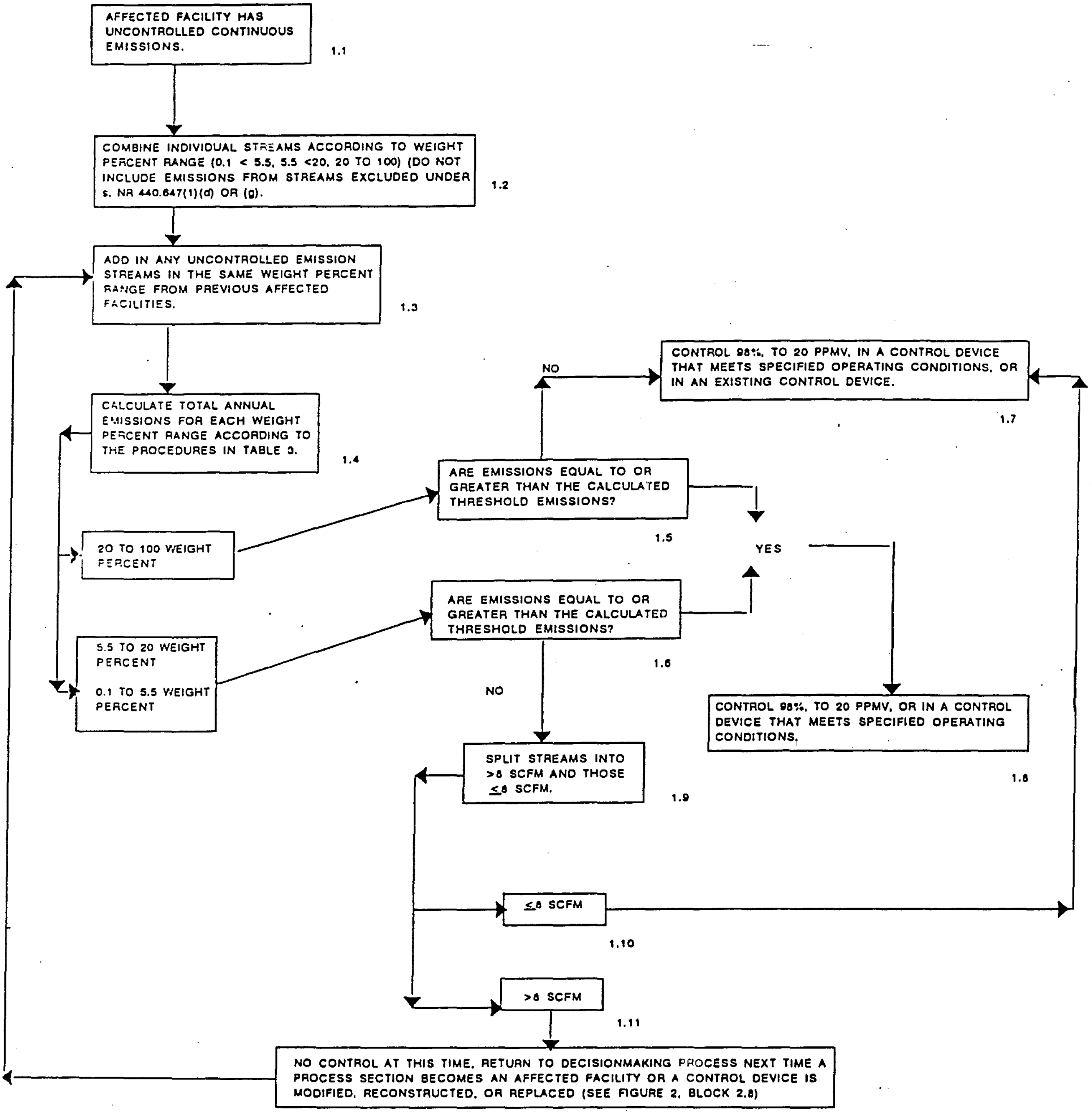
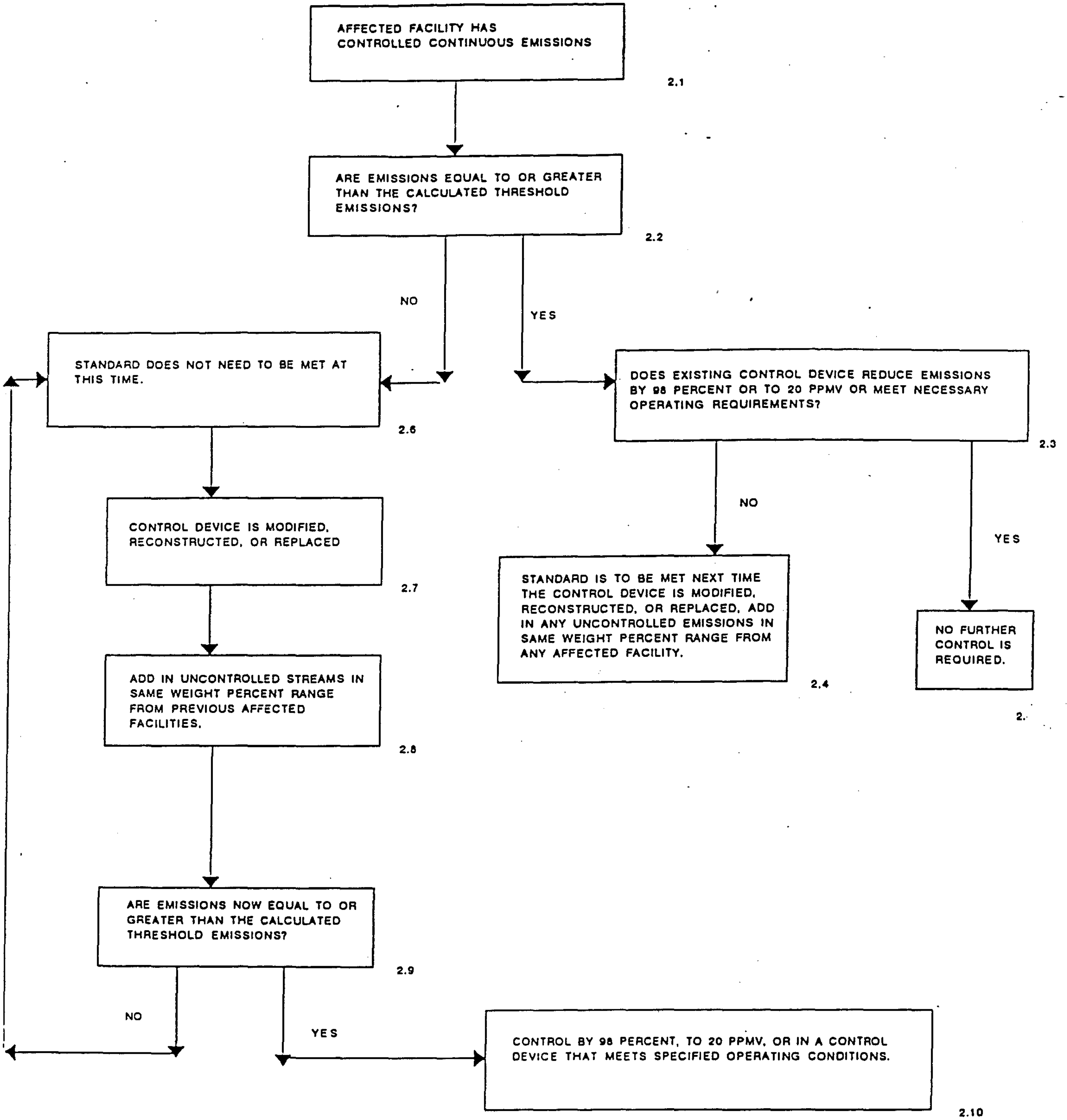


Figure 1. Decision making Process for Uncontrolled Continuous Emissions from Polypropylene and Polyethylene Affected Facilities

c. Controlled continuous emissions. For each vent stream that emits continuous emissions from an affected facility as defined in sub. (1)(a)1 and that is controlled in an existing control device, each owner or operator shall determine whether the emissions entering the control device are greater than or equal to the calculated threshold emissions (CTE) level, which is to be calculated using the TOC concentration of the inlet vent stream and the equations in footnote b of Table 3. If the inlet stream's TOC concentration is equal to or greater than 20 weight percent, the calculated threshold emissions level is 18.2 Mg/yr. If multiple emission streams are vented to the control device, the individual streams are not to be separated into individual weight percent ranges for calculation purposes as would be done for uncontrolled emission streams. Emissions vented to an existing control device are required to be controlled as described in subpar. c 1) and 2). Figure 2 illustrates the control determination procedure for controlled continuous emissions.



NOTE: There are no individual stream exemptions from emissions already controlled by existing control devices.

Figure 2. Decisionmaking Process for Continuous Emissions Already Controlled at Polypropylene and Polyethylene Affected Facilities.

1) If the annual emissions of the stream entering the control device are equal to or greater than the CTE levels, then compliance with one of the requirements identified in subpar. a 1), 2) or 3) is required when the control device is reconstructed or replaced or has its operating conditions modified as a result of state or local regulations, including changes in the operating permit, including those instances where the control device is reconstructed, replaced or modified in its operation at the same time the existing process section is modified or reconstructed and becomes an affected facility. If the existing control device already complies with one of the requirements identified in subpar. a 1), 2) or 3) no further control is required.

2) If the annual emissions of the stream entering the control device are less than the CTE level, then the requirements of subpar. a 1), 2) or 3) are not applicable at that time. However, if the control device is replaced, reconstructed or modified at a later date, each owner or operator shall reevaluate the applicability of these standards. This is done by combining with the vent stream entering the control device any uncontrolled vent streams in the same weight percent range as the controlled vent stream and determining whether the annual emissions of the stream entering the control device plus the applicable uncontrolled vent streams are greater than or equal to the CTE level, which is based on the weighted TOC concentration of the controlled vent stream and the uncontrolled vent streams. If the annual emissions entering the control device, including the applicable uncontrolled vent streams, are greater than or equal to the CTE level, then compliance with one of the requirements identified in subpar. a 1), 2) or 3) is required at that time for both the controlled and uncontrolled vent streams. If the annual emissions are less than the CTE level, compliance with these standards is again not required at such time. However, if the control device is again replaced, reconstructed or modified, each owner or operator shall repeat this determination procedure.

2. Intermittent emissions. The owner or operator shall control each vent stream that emits intermittent emissions from an affected facility as defined in sub. (1)(a)1 by meeting one of the control requirements specified in subd. 2 a and b. If a vent stream that emits intermittent emissions is controlled in an existing flare, incinerator, boiler or process heater, the requirements of this paragraph are waived until such time the control device is reconstructed or replaced or is modified in its operating conditions as a result of state or local regulation, including changes in the operating

permit. This paragraph does not apply to emergency vent streams exempted by sub. (1)(h) and as defined in sub. (2).

a. Combust the emissions in a flare that is:

1) Designed for and operated with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours,

2) Operated with a flame present at all times, and

3) Designed to maintain a stable flame.

b. Combust the emissions in an incinerator, boiler or process heater. The emissions shall be introduced into the flame zone of a boiler or process heater.

(b) Each owner or operator of a polystyrene process line containing process sections subject to the provisions of this section shall comply with the provisions in this subsection on and after the date on which the initial performance test required by s. NR 440.08 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup, whichever comes first. Each owner or operator of a polystyrene process line using a continuous process shall:

1. Limit the continuous TOC emissions from the material recovery section by complying with one of the following:

a. Not allow continuous TOC emissions to be greater than 0.0036 kg TOC/Mg product; or

b. Not allow the outlet gas stream temperature from each final condenser in the material recovery section to exceed -25°C (-13°F). For purposes of this standard, temperature excursions above this limit will not be considered a violation when the excursions occur during periods of startup, shutdown or malfunction; or

c. Comply with par. (a)1 a 1), 2) or 3)

2. If continuous TOC emissions from the material recovery section are routed through an existing emergency vapor recovery system, then compliance with these standards is required when the emergency vapor recovery system undergoes modification, reconstruction or replacement. In such instances, compliance with these standards shall be achieved no later than 180 days after completion of the modification, reconstruction or replacement.

(c) Each owner or operator of a poly(ethylene terephthalate) process line containing process sections subject to the provisions of this section shall comply with the provisions in this subsection on and after the date on which the initial performance test required by s. NR 440.08 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup, whichever comes first.

1. Each owner or operator of a PET process line using a dimethyl terephthalate process shall:

a. Limit the continuous TOC emissions from the material recovery section, that is, methanol recovery, by complying with one of the following:

1) Not allow the continuous TOC emissions to be greater than 0.018 kg TOC/Mg product; or

2) Not allow the outlet gas stream temperature from each final condenser in the material recovery section, that is, methanol recovery, to exceed +3°C (+37°F). For purposes of this standard, temperature excursions above this limit will not be considered a violation when the excursions occur during periods of startup, shutdown or malfunction.

b. Limit the continuous TOC emissions and, if steam-jet ejectors are used to provide vacuum to the polymerization reactors, the ethylene glycol concentration from the polymerization reaction section by complying with the following appropriate standard. The ethylene glycol concentration limits specified in subpar. b 2) and 3) shall be determined by the procedures specified in sub. (6)(j).

1) Not allow continuous TOC emissions from the polymerization reaction section, including emissions from any equipment used to further recover the ethylene glycol, but excluding those emissions from the cooling tower, to be greater than 0.02 kg TOC/Mg product; and

2) If steam-jet ejectors are used as vacuum producers and a low viscosity product is being produced using single or multiple end finishers or a high viscosity product is being produced using a single end finisher, maintain the concentration of ethylene glycol in the liquid effluent exiting the vacuum system servicing the polymerization reaction section at or below 0.35% by weight, averaged on a daily basis over a rolling 14-day period of operating days; or

3) If steam-jet ejectors are used as vacuum producers and a high viscosity product is being produced using multiple end finishers, maintain an ethylene glycol concentration in the cooling tower at or below 6.0% by weight averaged on a daily basis over a rolling 14-day period of operating days.

2. Each owner or operator of a PET process line using a terephthalic acid process shall:

a. Not allow the continuous TOC emissions from the esterification vessels in the raw materials preparation section to be greater than 0.04 kg TOC/Mg product.

b. Limit the continuous TOC emissions and, if steam-jet ejectors are used to provide vacuum to the polymerization reactors, the ethylene glycol concentration from the polymerization reaction section by complying with the following appropriate standard. The ethylene glycol concentration limits specified in subpar. b 2) and 3) shall be determined by the procedures specified in sub. (6)(j).

1) Not allow continuous TOC emissions from the polymerization reaction section, including emissions from any equipment used to further recover the ethylene glycol, but excluding those emissions from the cooling tower, to be greater than 0.02 kg TOC/Mg product; and

2) If steam-jet ejectors are used as vacuum producers and a low viscosity product is being produced using single or multiple end finishers or a high viscosity product is being produced using a single end finisher, maintain the concentration of ethylene glycol in the liquid effluent exiting the vacuum system servicing the polymerization reaction section at or below 0.35% by weight, averaged on a daily basis over a rolling 14-day period of operating days; or

3) If steam-jet ejectors are used as vacuum producers and a high viscosity product is being produced using multiple end finishers, maintain an ethylene glycol concentration in the cooling tower at or below 6.0% by weight averaged on a daily basis over a rolling 14-day period of operating days.

(d) Closed vent systems and control devices used to comply with this section shall be operated at all times when emissions may be vented to them.

(e) Vent systems that contain valves that could divert a vent stream from a control device shall have car-sealed opened all valves in the vent system from the emission source to the control device and car-sealed closed all valves in vent system that would lead the vent stream to the atmosphere, either directly or indirectly, bypassing the control device.

(4) STANDARDS: EQUIPMENT LEAKS OF VOC. (a) Each owner or operator of an affected facility subject to the provisions of this section shall comply with the requirements specified in s. NR 440.62(3) as soon as practicable, but no later than 180 days after initial startup, except that indications of

liquids dripping from bleed ports in existing pumps in light liquid service are not considered to be a leak as defined in s. NR 440.62(3)(b)2 b. For purposes of this standard, a "bleed port" is a technologically-required feature of the pump whereby polymer fluid used to provide lubrication, cooling, or both, of the pump shaft exits the pump, thereby resulting in a visible leak of fluid. This exemption expires when the existing pump is replaced or reconstructed.

(b) An owner or operator may elect to comply with the requirements specified in s. NR 440.62(4)(a) and (b).

(c) An owner or operator may apply to the administrator for a determination of equivalency for any means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to the reduction in emissions of VOC achieved by the controls required in this section. In doing so, the owner or operator shall comply with requirements specified in 40 CFR s. 60.484, incorporated by reference in s. NR 440.17.

(d) Each owner or operator subject to the provisions of this section shall comply with the provisions specified in s. NR 440.62(6) except an owner or operator may use the following provision in addition to s. NR 440.62(6)(e). Equipment is in light liquid service if the percent evaporated is greater than 10% at 150°C as determined by ASTM Method D86-78, incorporated by reference in s. NR 440.17.

(e) Each owner or operator subject to the provisions of this section shall comply with s. NR 440.62(7) and (8)

(5) MONITORING REQUIREMENTS. (a) Whenever a particular item of monitoring equipment specified in this subsection is to be installed, the owner or operator shall install, calibrate, maintain and operate according to manufacturer's specifications that item as follows:

1. A temperature monitoring device to measure and record continuously the operating temperature to within 1% (relative to degrees Celsius) or ±0.5°C (±0.9°F), whichever is greater.

2. A flame monitoring device, such as a thermocouple, an ultra-violet sensor, an infrared beam sensor or similar device to indicate and record continuously whether a flare or pilot light flame is present, as specified.

3. A flow monitoring indicator to indicate and record whether or not flow exists at least once every 15 minutes.

4. An organic monitoring device, based on a detection principle such as infrared, photoionization or thermal conductivity, to indicate and record continuously the concentration level of organic compounds.

5. A specific gravity monitoring device to measure and record continuously to within 0.02 specific gravity unit.

(b) The owner or operator shall install, as applicable, the monitoring equipment for the control means used to comply with sub. (3) except sub. (3)(a)1 a 4) as follows:

1. If the control equipment is an incinerator:

a. For a noncatalytic incinerator, a temperature monitoring device shall be installed in the firebox.

b. For a catalytic incinerator, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalytic bed.

2. If a flare is used:

a. A flame monitoring device shall be installed to indicate the presence of a flare flame or a flame for each pilot light, if the flare is used to comply with sub. (3)(a)1 including those flares controlling both continuous and intermittent emissions.

b. A thermocouple or equivalent monitoring device to indicate the presence of a flame at each pilot light, if used to comply with sub. (3)(a)2.

3. If a boiler or process heater is used:

a. If the boiler or process heater has a heat input design capacity of less than 150 million Btu/hr, a temperature monitoring device shall be installed between the radiant section and the convection zone for watertube boilers and between the furnace, combustion zone, and the firetubes for firetube boilers.

b. If the boiler or process heater has a heat input design capacity of 150 million Btu/hr or greater, records to indicate the periods of operation of the boiler or process heater shall be maintained. The records shall be readily available for inspection.

4. If an absorber is the final unit in a system:

a. A temperature monitoring device and a specific gravity monitoring device for the scrubber liquid shall be installed; or

b. An organic monitoring device shall be installed at the outlet of the absorber.

5. If a condenser is the final unit in a system:

a. A temperature monitoring device shall be installed at the condenser exit (product side); or

b. An organic monitoring device shall be installed at the outlet of the condenser.

6. If a carbon adsorber is the final unit in a system, an organic monitoring device shall be installed at the outlet of the carbon bed.

(c) Owners or operators of control devices used to comply with the provisions of this section, except sub. (3)(a)1 a 4) shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs.

(d) Owners or operators using a vent system that contains valves that could divert a vent stream from a control device used to comply with the provisions of this section shall do one or a combination of the following:

1. Install a flow indicator immediately downstream of each valve that if opened would allow a vent stream to bypass the control device and be emitted, either directly or indirectly, to the atmosphere. The flow indicator shall be capable of recording flow at least once every 15 minutes.

2. Monitor the valves once a month, checking the position of the valves and the condition of the car seal and identify all times when the car seals have been broken and the valve position has been changed, that is, from opened to closed for valves in the vent piping to the control device and from closed to open for valves that allow the stream to be vented directly or indirectly to the atmosphere.

(e) An owner or operator complying with the standards specified under sub. (3) except sub. (3)(a)1 a 4) with control devices other than an incinerator, boiler, process heater, flare, absorber, condenser or carbon adsorber or by any other means shall provide to the department information describing the operation of the control device and the process parameters which would indicate proper operation and maintenance of the device. The department may request further information and will specify appropriate monitoring procedures or requirements.

(6) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, or other methods and procedures specified in this subsection, except as provided under s. NR 440.08(2). Owners or operators complying with sub. (3)(a)1 a 4) need not perform a

performance test on the control device, provided the control device is not used to comply with any other requirement of sub. (3)(a).

1. Whenever changes are made in production capacity, feedstock type or catalyst type or whenever there is replacement, removal or addition of a control device, each owner or operator shall conduct a performance test according to the procedures in this subsection as appropriate, in order to determine compliance with sub. (3).

2. Where a boiler or process heater with a design heat input capacity of 150 million Btu/hr or greater is used, the requirement for an initial performance test is waived, in accordance with s. NR 440.08(2). However, the department reserves the option to require testing at such other times as may be required, as provided for in ch. NR 439.

3. The owner or operator shall determine the average organic concentration for each performance test run using the equipment described in sub. (5)(a)4. The average organic concentration shall be determined from measurements taken at least every 15 minutes during each performance test run. The average of the 3 runs shall be the base value for the monitoring program.

4. When an absorber is the final unit in the system, the owner or operator shall determine the average specific gravity for each performance test run using specific gravity monitoring equipment described in sub. (5)(a)5. An average specific gravity shall be determined from measurements taken at least every 15 minutes during each performance test run. The average of the 3 runs shall be the base value for the monitoring program.

5. When a condenser is the final unit in the system, the owner or operator shall determine the average outlet temperature for each performance test run using the temperature monitoring equipment described in sub. (5)(a)1. An average temperature shall be determined from measurements taken at least every 15 minutes during each performance test run while the vent stream is normally routed and constituted. The average of the 3 runs shall be the base value for the monitoring program.

(b) Except as provided for in par. (c), the owner or operator shall determine compliance with the emission concentration standard in sub. (3)(a)1 a 1) or (b)1 c if applicable.

1. The TOC concentration is the sum of the individual components and shall be computed for each run using the following equation:

$$C_{TOC} = \sum_{j=1}^{n} C_j$$

where:

C_{TOC} is the concentration of TOC (minus methane and ethane), dry basis, ppmv

C_j is the concentration of sample component j, ppm

n is the number of components in the sample

a. Method 18 of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17 shall be used to determine the concentration of each individual organic component (C_j) in the gas stream. Method 1 or 1A of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, as appropriate, shall be used to determine the sampling site at the outlet of the control device. Method 4 of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17 shall be used to determine the moisture content, if necessary.

b. The sampling time for each run shall be 1 hour in which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used, then the samples shall be taken at 15 minute intervals.

2. If supplemental combustion air is used, the TOC concentration shall be corrected to 3% oxygen and shall be computed using the following equation:

$$C_{CORR} = C_{MEAS} \times \frac{17.9}{20.9 - \%O_{2d}}$$

where:

C_{CORR} is the concentration of TOC corrected to 3% oxygen, dry basis, ppm by volume

C_{MEAS} is the concentration of TOC (minus methane and ethane), dry basis, ppm by volume, as calculated in subd. 1

$\%O_{2d}$ is the concentration of O_2, dry basis, percent by volume

a. The emission rate correction factor, integrated sampling and analysis procedure of Method 3 of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17 shall be used to determine the oxygen concentration ($\%O_{2d}$). The sampling site shall be the same as that of the TOC sample and the samples shall be taken during the same time that the TOC samples are taken.

(c) If par. (b) is not applicable, then the owner or operator shall determine compliance with the percent emission reduction standard in sub. (3)(a)1 a 1) or (b)1 c as follows:

1. The emission reduction of TOC (minus methane and ethane) shall be determined using the following equation:

$$P = \frac{E_{inlet} - E_{outlet}}{E_{inlet}} \times 100$$

where:

P is the percent emission reduction, by weight

E_{inlet} is the mass rate of TOC entering the control device, kg TOC/hr

E_{outlet} is the mass rate of TOC, discharged to the atmosphere, kg TOC/hr

2. The mass rates of TOC (E_i, E_o) shall be computed using the following equations:

$$E_i = K_1 \left(\sum_{j=1}^{n} C_{ij}M_{ij}\right) Q_i$$

$$E_o = K_1 \left(\sum_{j=1}^{n} C_{oj}M_{oj}\right) Q_o$$

where:

C_{ij} and C_{oj} are the concentration of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, dry basis, ppmv

M_{ij} and M_{oj} are the molecular weight of sample component "j" of the gas stream at the inlet and outlet of the control device respectively, g/g-mole (lb/lb-mole)

Q_i and Q_o are the flow rate of the gas stream at the inlet and outlet of the control device, respectively, dscm/hr (dscf/hr)

$K_1 = 4.157 \times 10^{-8}$ [(kg)/g-mole)]/[(g)(ppm)(dscm)]

{5.711×10^{-15} [(lb)/(lb-mole)]/[(lb)(ppm)(dscf)]}

a. Method 18 shall be used to determine the concentration of each individual organic component (C_{ij}, C_{oj}) in the gas stream. Method 1 or 1A, as appropriate, shall be used to determine the inlet and outlet sampling sites. The inlet site shall be before the inlet of the control device and after all product recovery units.

b. Method 2, 2A, 2C or 2D of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17, as appropriate, shall be used to determine the volumetric flow rates (Q_i, Q_o). If necessary, Method 4 shall be used to determine the moisture content. Both determinations shall be compatible with the Method 18 determinations.

c. Inlet and outlet samples shall be taken simultaneously. The sampling time for each run shall be 1 hour in which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used, then the samples shall be taken at 15 minute intervals.

(d) An owner or operator shall determine compliance with the individual stream exemptions in sub. (1)(g) and the procedures specified in Table 3 for compliance with sub. (3)(a)1 as identified in subd. 1 and 2. An owner or operator using the procedures specified in sub. (3)(a)1 for determining which continuous process emissions are to be controlled may use calculations demonstrated to be sufficiently accurate as to preclude the necessity of actual testing for purposes of calculating the uncontrolled annual emissions and weight percent of TOC. Owners or operators seeking to exempt streams under sub. (1)(g) shall use the appropriate test procedures specified in this subsection.

1. The uncontrolled annual emissions of the individual vent stream shall be determined using the following equation:

$$E_{unc} = K_1 \left(\sum_{j=1}^{n} C_j M_j\right) Q \times 8{,}600 \times \frac{1\ \text{Mg}}{1{,}000\ \text{kg}}$$

where:

E_{unc} is the uncontrolled annual emissions, Mg/yr

C_j is the concentration of sample component "j" of the gas stream, dry basis, ppmv

M_j is the molecular weight of sample component "j" of the gas stream, g/g-mole (lb/lb-mole)

Q is the flow rate of the gas stream, dscm/hr (dscf/hr)

$K_1 = 4.157 \times 10^{-8}$ [(kg)/g-mole)]/[(g)(ppm)(dscm)]

{5.711×10^{-15} [(lb)/(lb-mole)]/[(lb)(ppm)(dscf)]}

8,600 is the number of operating hours per year

a. Method 18 shall be used to determine the concentration of each individual organic component (C_j) in the gas stream. Method 1 or 1A, as appropriate, shall be used to determine the sampling site. If the gas stream is controlled in an existing control device, the sampling site shall be before the inlet of the control device and after all product recovery units.

b. Method 2, 2A, 2C or 2D, as appropriate, shall be used to determine the volumetric flow rate (Q). If necessary, Method 4 shall be used to determine the moisture content. Both determinations shall be compatible with the Method 18 determinations.

c. The sampling time for each run shall be 1 hour in which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used, then the samples shall be taken at 15 minute intervals.

2. The weight percent VOC of the uncontrolled individual vent stream shall be determined using the following equation:

$$\text{weight \% TOC} = \frac{\sum_{j=1}^{n} C_j \, M_j}{MW_{gas} \times 10^6} \times 100$$

where:

C_j is the concentration of sample TOC component "j" of the gas stream, dry basis, ppmv

M_j is the molecular weight of sample TOC component "j" of the gas stream, g/g-mole (lb/lb-mole)

MW_{gas} is the average molecular weight of the entire gas stream, g/g-mole (lb/lb-mole)

a. Method 18 shall be used to determine the concentration of each individual organic component (C_j) in the gas stream. Method 1 or 1A, as appropriate, shall be used to determine the sampling site. If the gas stream is controlled in an existing control device, the sampling site shall be before the inlet of the control device and after all product recovery units. If necessary, Method 4 shall be used to determine the moisture content. This determination shall be compatible with the Method 18 determinations.

b. The average molecular weight of the gas stream shall be determined using methods approved by the department. If the carrier component of the gas stream is nitrogen, then an average molecular weight of 28 g/g-mole (lb/lb-mole) may be used in lieu of testing. If the carrier component of the gas stream is air, then an average molecular weight of 29 g/g-mole (lb/lb-mole) may be used in lieu of testing.

c. The sampling time for each run shall be 1 hour in which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used, then the samples shall be taken at 15 minute intervals.

(e) The owner or operator shall determine compliance of flares with the visible emission and flare provisions in sub. (3) as follows:

1. Method 22 of 40 CFR part 60, Appendix A, incorporated by reference in s. NR 440.17 shall be used to determine visible emission. The observation period for each run shall be 2 hours.

2. The monitoring device of sub. (5)(b)2 shall be used to determine whether a flame is present.

(f) The owner or operator shall determine compliance with the net heating value provisions in s. NR 440.18 as referenced by sub. (3)(a)1 a 3). The net heating value of the process vent stream being combusted in a flare shall be computed as follows:

$$H_T = K_2 \left(\sum_{j=1}^{n} C_j H_j \right)$$

where:

H_T is the net heating value of the sample based on the net enthalpy per mole of offgas combusted at 25°C and 760 mmHg, but the standard temperature for determining the volume corresponding to one mole is 20°C, MJ/scm

K_2 is a conversion constant,

$$1.740 \times 10^{-7} \left(\frac{1}{\text{ppm}}\right)\left(\frac{\text{g-mole}}{\text{scm}}\right)\left(\frac{\text{MJ}}{\text{kcal}}\right),$$

where standard temperature for (g-mole)/scm is 20°C;

C_j is the concentration of sample component j in ppm on a wet basis

H_j is the net heat of combustion of sample component j, at 25°C and 760 mm Hg, kcal/g-mole

1. Method 18 shall be used to determine the concentration of each individual organic component (C_j) in the gas stream. Method 1 or 1A, as appropriate, shall be used to determine the sampling site to the inlet of the flare. Using this same sample, ASTM D1946-77, incorporated by reference in s. NR 440.17, shall be used to determine the hydrogen and carbon monoxide content.

2. The sampling time for each run shall be 1 hour in which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used, then the samples shall be taken at 15 minute intervals.

3. Published or calculated values shall be used for the net heats of combustion of the sample components. If values are not published or cannot be calculated, ASTM D2382-76, incorporated by reference in s. NR 440.17 may be used to determine the net heat of combustion of component "j".

(g) The owner or operator shall determine compliance with the exit velocity provisions in s. NR 440.18 as referenced by sub. (3)(a)1 a 3) as follows:

1. If applicable, the net heating value (H_T) of the process vent shall be determined according to the procedures in par. (f) to determine the applicable velocity requirements.

2. If applicable, the maximum permitted velocity (V_{max}) for steam-assisted and nonassisted flares shall be computed using the following equation:

$$\mathrm{Log}_{10}(V_{max}) = (H_T + 28.8)/31.7$$

where:

V_{max} is the maximum permitted velocity, m/sec

28.8 is a constant

31.7 is a constant

H_T is the net heating value as determined in par. (f)

3. The maximum permitted velocity, V_{max}, for air-assisted flares shall be determined by the following equation:

$$V_{max} = 8.706 + 0.7084(H_T)$$

where:

V_{max} is the maximum permitted velocity, m/sec

8.706 is a constant

0.7084 is a constant

H_T is the net heating value as determined in par. (f)

4. The actual exit velocity of a flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Method 2, 2A, 2C or 2D as appropriate, by the unobstructed (free) cross sectional area of the flare tip.

(h) The owner or operator shall determine compliance with the mass emission per mass product standards in sub. (1)(d) and (e) and in sub. (3)(b)1 a, (c)1 a 1), 2 a and b 1. The emission rate of TOC shall be computed using the following equation:

$$ER_{TOC} = \frac{E_{TOC}}{P_p \times \frac{1 \text{ Mg}}{1,000 \text{ kg}}}$$

where:

ER_{TOC} is the emission rate of total organic compounds (minus methane and ethane), kg TOC/Mg product

E_{TOC} is the emission rate of total organic compounds (minus methane and ethane) in the sample, kg/hr

P_p is the rate of polymer produced, kg/hr

1. The mass rate of TOC, E_{TOC}, shall be determined according to the procedures, as appropriate, in par. (c)2. The sampling site for determining compliance with sub. (1)(d) and (e) shall be before any add-on control devices and after all product recovery devices. Otherwise, the sampling site shall be at the outlet of the control device.

2. The rate of polymer produced, P_p (kg/hr), shall be determined by dividing the weight of polymer pulled in kilograms (kg) from the process line during the performance test by the number of hours (hr) taken to perform the performance test. The polymer pulled, in kilograms, shall be determined by direct measurement or, subject to prior approval by the department computed from materials balance by good engineering practice.

(i) The owner or operator shall determine continuous compliance with the temperature requirements in sub. (3)(b)1 b and 1 a 2) by using the temperature monitoring equipment described in sub. (5)(a)1. An average temperature shall be determined from measurements taken at least every 15 minutes every 3 hours while the vent stream is normally routed and constituted. Each 3-hour period constitutes a performance test.

(j) For purposes of determining compliance with sub. (3)(c)1 b 2), b 3), 2 b 2) or b 3), the ethylene glycol concentration in either the cooling tower or the liquid effluent from steam-jet ejectors used to produce a vacuum in the polymerization reactors, whichever is applicable, shall be determined:

1. Using procedures that conform to the methods described in ASTM D2908-74, Standard Practice for Measuring Volatile Organic Matter in Water by Aqueous-Injection Gas Chromatography, incorporated by reference in s. NR 440.17 except as provided in par. (j)2:

a. At least one sample per operating day shall be collected using the grab sampling procedures of ASTM D3370-76, Standard Practices for Sampling Water, incorporated by reference in s. NR 440.17. An average ethylene glycol concentration by weight shall be calculated on a daily basis over a rolling 14-day period of operating days, except as provided in par. (j)1 b and c. Each daily average ethylene glycol concentration so calculated constitutes a performance test. Exceedance of the standard during the reduced testing program specified in par. (j)1 b and c is a violation of these standards.

b. For those determining compliance with sub. (3)(c)1 b 2) or 2 b 2), the owner or operator may elect to reduce the sampling program to any 14 consecutive day period once every 2 calendar months, if at least 17 consecutive 14-day rolling average concentrations immediately preceding the reduced sampling program are each less than 0.10 weight percent ethylene glycol. If the average concentration obtained over the 14 day sampling during the reduced testing period exceeds the upper 95% confidence interval calculated from the most recent test results in which no one 14-day average exceeded 0.10 weight percent ethylene glycol, then the owner or operator shall reinstitute a daily sampling program. A reduced sampling program can be reinstituted if the requirements specified in this paragraph are met.

c. For those determining compliance with sub. (3)(c)1 b 3) or 2 b 3) the owner or operator may elect to reduce the sampling program to any 14 consecutive day period once every 2 calendar months, if at least 17 consecutive 14-day rolling average concentrations immediately preceding the reduced sampling program are each less than 1.8 weight percent ethylene glycol. If the average concentration obtained over the 14 day sampling during the reduced test period exceeds the upper 95% confidence interval calculated from the most recent test results in which no one 14-day average exceeded 1.8 weight percent ethylene glycol, then the owner or operator shall reinstitute a daily sampling program. A reduced program can be reinstituted if the requirements specified in this paragraph are met.

d. The upper 95% confidence interval shall be calculated using the equation:

$$CI_{95} = \frac{\sum_{i=1}^{n} X_i}{n} + 2\left[\frac{n \sum X_i^2 - (\sum X_i)^2}{n(n-1)}\right]^{0.5}$$

where:

X_i is the daily ethylene glycol concentration for each day used to calculate each 14-day rolling average used in test results to justify implementing the reduced testing program

n is the number of ethylene glycol concentrations

2. Measuring an alternative parameter, such as carbon oxygen demand or biological oxygen demand, that is demonstrated to be directly proportional to the ethylene glycol concentration. Such parameter shall be measured during the initial 14-day performance test during which the facility is shown to be in compliance with the ethylene glycol concentration standard whereby the ethylene glycol concentration is determined using the procedures described in par. (j)1. The alternative parameter shall be measured on a daily basis and the average value of the alternative parameter shall be calculated on a daily basis over a rolling 14-day period of operating days. Each daily average value of the alternative parameter constitutes a performance test.

(7) REPORTING AND RECORDKEEPING REQUIREMENTS. (a) Each owner or operator subject to the provisions of this section shall keep an up-to-date, readily-accessible record of the following information measured during each performance test and shall include the following information in the report of the initial performance test in addition to the written results of such performance tests as required under s. NR 440.08. Where a control device is used to comply with sub. (3)(a)1 a 4) only, a report containing performance test data need not be submitted, but a report containing the information in subd. 11 is required. Where a boiler or process heater with a design heat input capacity of 150 million Btu/hr or greater is used to comply with sub. (3)(a) a report containing performance test data need not be submitted, but a report containing the information in subd. 2 a is required. The same information specified in this subsection shall be submitted in the reports of all subsequently required performance tests where either the emission control efficiency of a combustion device or the outlet concentration of TOC, minus methane and ethane, is determined.

1. When an incinerator is used to demonstrate compliance with sub. (3) except sub. (3)(a)2:

a. The average firebox temperature of the incinerator (or the average temperature upstream and downstream of the catalyst bed), measured at least every 15 minutes and averaged over the performance test period and

b. The percent reduction of TOC (minus methane and ethane) achieved by the incinerator, the concentration of TOC (minus methane and ethane) (ppmv, by compound) at the outlet of the control device on a dry basis or the emission rate in terms of kilograms TOC (minus methane and ethane) per megagram of product at the outlet of the control device, whichever is appropriate. If supplemental combustion air is used, the TOC concentration corrected to 3% oxygen shall be recorded and reported.

2. When a boiler or process heater is used to demonstrate compliance with sub. (3) except sub. (3)(a)2:

a. A description of the location at which the vent stream is introduced into the boiler or process heater and

b. For boilers or process heaters with a design heat input capacity of less than 150 million Btu/hr, all 3-hour periods of operation during which the average combustion temperature was more than 28°C (50°F) below the average combustion temperature during the most recent performance test at which compliance was determined.

3. When a flare is used to demonstrate compliance with sub. (3) except sub. (3)(a)2:

a. All visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the performance test,

b. Continuous records of the pilot flame heat-sensing monitoring and

c. Records of all periods of operations during which the pilot flame is absent.

4. When an incinerator, boiler or process heater is used to demonstrate compliance with sub. (3)(a)2, a description of the location at which the vent stream is introduced into the incinerator, boiler or process heater.

5. When a flare is used to demonstrate compliance with sub. (3)(a)2:

a. All visible emission readings made during the performance test,

b. Continuous records of the pilot flame heat-sensing monitoring, and

c. Records of all periods of operation during which the pilot flame is absent.

6. When an absorber is the final unit in a system to demonstrate compliance with sub. (3) except sub. (3)(a)2, the specific gravity, or alternative parameter that is a measure of the degree of absorbing liquid saturation, if approved by the department, and average temperature, measured at least every 15 minutes and averaged over the performance test period, of the absorbing liquid, both measured while the vent stream is normally routed and constituted.

7. When a condenser is the final unit in a system to demonstrate compliance with sub. (3) except sub. (3)(a)2 the average exit (product side) temperature, measured at least every 15 minutes and averaged over the performance test period while the vent stream is normally routed and constituted.

8. Daily measurement and daily average 14-day rolling average of the ethylene glycol concentration in the liquid effluent exiting the vacuum system servicing the polymerization reaction section, if an owner or operator is subject to sub. (3)(c)1 b 2) or 2 b 2) or of the ethylene glycol concentration in the cooling water in the cooling tower, if subject to sub. (3)(c)2 b 3) or c 3).

9. When a carbon adsorber is the final unit in a system to demonstrate compliance with sub. (3) except sub. (3)(a)2, the concentration level or reading indicated by the organics monitoring device at the outlet of the adsorber, measured at least every 15 minutes and averaged over the performance test period while the vent stream is normally routed and constituted.

10. When an owner or operator seeks to comply with the requirements of this section by complying with the uncontrolled threshold emission rate cutoff provision in sub. (1)(d) and (e) or with the individual stream exemptions in sub. (1)(g), each process operation variable, for example, pressure, temperature, type of catalyst, that may result in an increase in the uncontrolled emission rate, if sub. (1)(d) or (e) is applicable or in an increase in the uncontrolled annual emissions or the VOC weight percent, as appropriate, if sub. (1)(g) is applicable, should such operating variable be changed.

11. When an owner or operator uses a control device to comply with sub. (3)(a)1 a 4) alone: all periods when the control device is not operating.

(b)1. Each owner or operator subject to the provisions of this section shall submit with the initial performance test or, if complying with sub. (3)(a)1 a 4) as a separate report, an engineering report describing in detail the vent system used to vent each affected vent stream to a control device. This report shall include all valves and vent pipes that could vent the stream to the atmosphere, thereby bypassing the control device and identify which valves are car-sealed opened and which valves are car-sealed closed.

2. If a vent system containing valves that could divert the emission stream away from the control device is used, each owner or operator subject to the provisions of this section shall keep for at least 2 years up-to-date, readily accessible continuous records of:

a. All periods when flow is indicated if flow indicators are installed under sub. (5)(d)1.

b. All times when maintenance is performed on car-sealed valves, when the car seal is broken and when the valve position is changed, that is, from open to closed for valves in the vent piping to the control device and from closed to open for valves that vent the stream directly or indirectly to the atmosphere bypassing the control device.

(c) Where an incinerator is used to comply with sub. (3), except sub. (3)(a)1 a 4) and 2, each owner or operator subject to the provisions of this section shall keep for at least 2 years up-to-date, readily accessible continuous records of:

1. The temperature measurements specified under sub. (5)(b)1.

2. Records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. Periods of operation during which the parameter boundaries established during the most recent performance test are exceeded are defined as follows:

a. For noncatalytic incinerators, all 3-hour periods of operation during which the average combustion temperature was more than 28°C (50°F) below the average combustion temperature during the most recent performance test at which compliance was demonstrated.

b. For catalytic incinerators, all 3-hour periods of operation during which the average temperature of the vent stream immediately before the catalyst bed is more than 28°C (50°F) below the average temperature of the vent stream during the most recent performance test at which compliance was demonstrated. The owner or operator also shall record all 3-hour periods of operation during which the average temperature difference across the catalyst bed is less than 80% of the average temperature difference across the catalyst bed during the most recent performance test at which compliance was demonstrated.

(d) Where a boiler or process heater is used to comply with sub. (3) except sub. (3)(a)1 a 4) and (a)2, each owner or operator subject to the provisions of this section shall keep for at least 2 years up-to-date, readily accessible continuous records of:

1. Where a boiler or process heater with a heat input design capacity of 150 million Btu/hr or greater is used, all periods of operation of the boiler or process heater,

Note: Examples of such records could include records of steam use, fuel use or monitoring data collected pursuant to other state or federal regulatory requirements.

2. Where a boiler or process heater with a heat input design capacity of less than 150 million Btu/hr is used, all periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. Periods of operation during which the parameter boundaries established during the most recent performance test are exceeded are defined as all 3-hour periods of operation during which the average combustion temperature was more than 28°C (50°F) below the average combustion temperature during the most recent performance test at which compliance was demonstrated.

(e) Where a flare is used to comply with sub. (3) except sub. (3)(a)1 a 4), each owner or operator subject to the provisions of this section shall keep for at least 2 years up-to-date, readily accessible continuous records of:

1. The flare or pilot light flame heat sensing monitoring specified under sub. (5)(b)2 and

2. All periods of operation in which the flare or pilot flame, as appropriate, is absent.

(f) Where an adsorber, condenser, absorber or a control device other than a flare, incinerator, boiler or process heater is used to comply with sub. (3) except sub. (3)(a)1 a 4), each owner or operator subject to the provisions of this section shall keep for at least 2 years up-to-date, readily-accessible continuous records of the periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. Where an owner or operator seeks to comply with sub. (3), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

1. Where an absorber is the final unit in a system:

a. All 3-hour periods of operation during which the average absorbing liquid temperature was more than 11°C (20°F) above the average absorbing liquid temperature during the most recent performance test at which compliance was demonstrated are exceeded, and

b. All 3-hour periods of operation during which the average absorbing liquid specific gravity was more than 0.1 unit above or more than 0.1 unit below, the average absorbing liquid specific gravity during the most recent performance test at which compliance was demonstrated, unless monitoring of an alternative parameter that is a measure of the degree of absorbing liquid saturation is approved by the department, in which case appropriate parameter boundaries and periods of operation during which they are exceeded will be defined.

2. Where a condenser is the final unit in a system, all 3-hour periods of operation during which the average condenser operating temperature was more than 6°C (10°F) above the average operating temperature during the most recent performance test at which compliance was demonstrated.

3. Where a carbon adsorber is the final unit in a system, all 3-hour periods of operation during which the average organic concentration level in the carbon adsorber gases is more than 20% greater than the exhaust gas

concentration level or reading measured by the organics monitoring system during the most recent performance test at which compliance was demonstrated.

(g) Each owner or operator of an affected facility subject to the provisions of this section and seeking to demonstrate compliance with sub. (3) shall keep up-to-date, readily accessible records of:

1. Any changes in production capacity, feedstock type or catalyst type or of any replacement, removal or addition of product recovery equipment; and

2. The results of any performance test performed pursuant to the procedures specified by sub. (6).

(h) Each owner or operator of an affected facility that seeks to comply with the requirements of this section by complying with the uncontrolled threshold emission rate cutoff provision in sub. (1)(d) and (e) or with the individual stream exemptions in sub. (1)(g) shall keep for at least 2 years up-to-date, readily accessible records of any change in process operation that increases the uncontrolled emission rate of the process line in which the affected facility is located, if sub. (1)(d) or (e) is applicable or that increase the uncontrolled annual emissions or the VOC weight percent of the individual stream, if sub. (1)(g) is applicable.

(i) Each owner and operator subject to the provisions of this section is exempt from s. NR 440.07(3).

(j) The department will specify appropriate reporting and recordkeeping requirements where the owner or operator of an affected facility complies with the standards specified under sub. (3) other than as provided under par. (a) to (e).

(k) Each owner or operator that seeks to comply with the requirements of this section by complying with the uncontrolled threshold emission rate cutoff provision of sub. (1)(d) and (e), the individual stream exemptions of sub. (1)(g) or the requirements of sub. (3) shall submit to the department semiannual reports of the following recorded information, as applicable. The initial report shall be submitted within 6 months after the initial startup date.

1. Exceedances of monitored parameters recorded under pars. (c), (d)2 and (f).

2. All periods recorded under par. (b) when the vent stream has been diverted from the control device.

3. All periods recorded under par. (d) when the boiler or process heater was not operating.

4. All periods recorded under par. (e) in which the flare or pilot flame was absent.

5. All periods recorded under par. (a)8 when the 14-day rolling average exceeded the standard specified in sub. (3)(c)1 b 2), 3), 2 b 2) or 3) as applicable.

6. Any change in process operations that increases the uncontrolled emission rate of the process line in which the affected facility is located, as recorded in par. (h).

7. Any change in process operations that increases the uncontrolled annual emissions or the VOC weight percent of the individual stream, as recorded in par. (h).

(1) Each owner or operator subject to the provisions of this section shall notify the department of the specific provisions of sub. (1)(d) or (e), (3) or (4), as applicable, with which the owner or operator has elected to comply. Notification shall be submitted with the notification of initial startup required by sub. (1)(c). If an owner or operator elects at a later date to use an alternative provision of sub. (3) or (4) with which he or she will comply or becomes subject to sub. (3) or (4) for the first time, that is, the owner or operator can no longer meet the requirements of this section by complying with the uncontrolled threshold emission rate cutoff provision in sub. (1)(d) or (e), then the owner or operator shall notify the department 90 days before implementing a change and, upon implementing a change, a performance test shall be performed as specified in sub. (6).

SECTION 167. NR 440.67(4)(b)2. and (5)(a)2. are amended to read:

NR 440.67(4)(b)2. VOC emissions shall be determined each calendar month by use of the following equations:

$E = \frac{M_W}{S_W} - N - I$ ~~and~~ where $M_W = M_V S_P D$,

$$S_W = \frac{S_V S_P D}{1000} \quad \text{and} \quad I = \frac{I_E - I_S}{S_W}$$

where all values are for the calendar month only and where:

E ~~— Emissions~~ is the emissions in kg per Mg solvent feed;

S_v ~~— Measured~~ is the measured or calculated volume of solvent feed in liters;

S_w ~~— Weight~~ is the weight of solvent feed in Mg;

M_v ~~— Measured~~ is the measured volume of makeup solvent in liters;

M_w ~~— Weight~~ is the weight of makeup in kg;

N ~~— Allowance~~ is the allowance for nongaseous losses per Mg solvent feed; 13 kg per Mg solvent feed to the spinning solution preparation system and precipitation bath. This value shall be used in all cases unless an owner or operator demonstrates to the satisfaction of the department that greater nongaseous losses occur at the affected facility. In this case, the greater value may be substituted in the equation;

S_p ~~— Fraction~~ is the fraction of measured volume that is actual solvent (excludes water);

D ~~— Density~~ is the density of the solvent in kg/liter;

I ~~— Allowance~~ is the allowance for solvent inventory variation or changes in the amount of solvent contained in the affected facility per Mg solvent feed (may be positive or negative);

I_S ~~— Amount~~ is the amount in kg of solvent contained in the affected facility at the beginning of test period, as determined by owner or operator;

I_E ~~— Amount~~ is the amount in kg of solvent contained in the affected facility at the close of test period, as determined by owner or operator.

(5)(a)2. The results of subsequent performance tests that indicate that VOC emissions exceed the standards in sub. (3). These reports shall be submitted ~~semiannually at six month intervals,~~ quarterly at 3-month intervals after the initial performance test. If no exceedances occur during a particular quarter, a report stating this shall be submitted to the department semiannually.

SECTION 168. NR 440.675 is created to read:

NR 440.675 VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS FROM THE SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY (SOCMI) AIR OXIDATION UNIT PROCESSES. (1) APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY. (a) The provisions of this section apply to each affected facility designated in par. (b) that produces any of the chemicals listed in sub. (8) as a product, co-product, by-product or intermediate, except as provided in par. (c).

(b) The affected facility is any of the following for which construction, modification or reconstruction commenced after October 21, 1983:

1. Each air oxidation reactor not discharging its vent stream into a recovery system.

2. Each combination of an air oxidation reactor and the recovery system into which its vent stream is discharged.

3. Each combination of 2 or more air oxidation reactors and the common recovery system into which their vent streams are discharged.

(c) Each affected facility that has a total resource effectiveness (TRE) index value greater than 4.0 is exempt from all provisions of this section except for subs. (3), (5)(f), (6)(h) and (6)(1).

Note: The intent of these standards is to minimize the emissions of VOC through the application of best demonstrated technology (BDT). The numerical emission limits in these standards are expressed in terms of total organic compounds (TOC), measured as TOC minus methane and ethane. This emission limit reflects the performance of BDT.

(2) DEFINITIONS. (a) As used in this section, all terms not defined here shall have the meaning given them in s. NR 440.02 and the following terms shall have the specific meanings given them.

1. "Air oxidation reactor" means any device or process vessel in which one or more organic reactants are combined with air or a combination of air and oxygen, to produce one or more organic compounds. Ammoxidation and oxychlorination reactions are included in this definition.

2. "Air oxidation reactor recovery train" means an individual recovery system receiving the vent stream from at least one air oxidation reactor, along with all air oxidation reactors feeding vent streams into this system.

3. "Air oxidation unit process" means a unit process, including ammoxidation and oxychlorination unit process, that uses air or a combination of air and oxygen, as an oxygen source in combination with one or more organic reactants to produce one or more organic compounds.

4. "Boilers" means any enclosed combustion device that extracts useful energy in the form of steam.

5. "By compound" means by individual stream components, not carbon equivalents.

6. "Continuous recorder" means a data recording device recording an instantaneous data value at least once every 15 minutes.

7. "Flame zone" means the portion of the combustion chamber in a boiler occupied by the flame envelope.

8. "Flow indicator" means a device which indicates whether gas flow is present in a vent stream.

9. "Halogenated vent stream" means any vent stream determined to have a total concentration, by volume, of compounds containing halogens of 20 ppmv by compound or greater.

10. "Incinerator" means any enclosed combustion device that is used for destroying organic compounds and does not extract energy in the form of steam or process heat.

11. "Process heater" means a device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that is heated to produce steam.

12. "Process unit" means equipment assembled and connected by pipes or ducts to produce, as intermediate or final products, one or more of the chemicals in sub. (8). A process unit can operate independently if supplied with sufficient fuel or raw materials and sufficient product storage facilities.

13. "Product" means any compound or chemical listed in sub. (8) that is produced for sale as a final product as that chemical or is produced for use in a process that needs that chemical for the production of other chemicals in another facility. By-products, co-products and intermediates are considered to be products.

14. "Recovery device" means an individual unit of equipment, such as an absorber, condenser and carbon adsorber, capable of and used to recover chemicals for use, reuse or sale.

15. "Recovery system" means an individual recovery device or series of such devices applied to the same process stream.

16. "Total organic compounds" or "TOC" means those compounds measured according to the procedures in sub. (5)(b)4. For the purposes of measuring molar composition as required in sub. (5)(d)3 a, hourly emissions rate as required in sub. (5)(d) 6 and (e) and TOC concentration as required in sub. (6)(b)4 and (g)4, those compound which the department has determined do not contribute appreciably to the formation of ozone are to be excluded. The compounds to be excluded are identified in s. NR 400.02(100).

17. "Total resource effectiveness (TRE) index value" means a measure of the supplemental total resource requirement per unit reduction of TOC associated with an individual air oxidation vent stream, based on vent stream flow rate, emission rate of TOC, net heating value and corrosion properties, whether or not the vent stream is halogenated, as quantified by the equation given under sub. (5)(e).

18. "Vent stream" means any gas stream, containing nitrogen which was introduced as air to the air oxidation reactor, released to the atmosphere directly from any air oxidation reactor recovery train or indirectly, after diversion through other process equipment. The vent stream excludes equipment leaks and relief valve discharges including, but not limited to, pumps, compressors and valves.

(3) STANDARDS. Each owner or operator of any affected facility shall comply with par. (a), (b) or (c) for each vent stream on and after the date on which the initial performance test required by s. NR 440.08 and sub. (5) is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated or 180 days after the initial startup, whichever date comes first. Each owner or operator shall either:

(a) Reduce emissions of TOC (minus methane and ethane) by 98 weight-percent or to a TOC (minus methane and ethane) concentration of 20 ppmv on a dry basis corrected to 3% oxygen, whichever is less stringent. If a boiler or process heater is used to comply with this paragraph, then the vent stream shall be introduced into the flame zone of the boiler or process heater; or

(b) Combust the emissions in a flare that meets the requirements of s. NR 440.18; or

(c) Maintain a TRE index value greater than 1.0 without use of VOC emission control devices.

(4) MONITORING OF EMISSIONS AND OPERATIONS. (a) The owner or operator of an affected facility that uses an incinerator to seek to comply with the TOC emission limit specified under sub. (3)(a) shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment:

1. A temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1% of the temperature being monitored expressed in degrees Celsius or ±0.5°C, whichever is greater.

a. Where an incinerator other than a catalytic incinerator is used, a temperature monitoring device shall be installed in the firebox.

b. Where a catalytic incinerator is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.

2. A flow indicator that provides a record of vent stream flow to the incinerator at least once every hour for each affected facility. The flow indicator shall be installed in the vent stream from each affected facility at a point closest to the inlet of each incinerator and before being joined with any other vent stream.

(b) The owner or operator of an affected facility that uses a flare to seek to comply with sub. (3)(b) shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment:

1. A heat sensing device, such as an ultra-violet sensor or thermocouple, at the pilot light to indicate the continuous presence of a flame.

2. A flow indicator that provides a record of vent stream flow to the flare at least once every hour for each affected facility. The flow indicator shall be installed in the vent stream from each affected facility at a point closest to the flare and before being joined with any other vent stream.

(c) The owner or operator of an affected facility that uses a boiler or process heater to seek to comply with sub. (3)(a) shall install, calibrate, maintain and operate according to the manufacturer's specifications the following equipment:

1. A flow indicator that provides a record of vent stream flow to the boiler or process heater at least once every hour for each affected facility. The flow indicator shall be installed in the vent stream from each air oxidation reactor within an affected facility at a point closest to the inlet of each boiler or process heater and before being joined with any other vent stream.

2. A temperature monitoring device in the firebox equipped with a continuous recorder and having an accuracy of ±1% of the temperature being measured expressed in degrees Celsius or ±0.5°C, whichever is greater, for boilers or process heaters of less than 44 MW (150 million Btu/hr) heat input design capacity.

3. Monitor and record the periods of operation of the boiler or process heater if the design input capacity of the boiler is 44 MW (150 million Btu/hr) or greater. The records shall be readily available for inspection.

(d) The owner or operator of an affected facility that seeks to demonstrate compliance with the TRE index value limit specified under sub. (3)(c) shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment, unless alternative monitoring procedures or requirements are approved for that facility by the department:

1. Where an absorber is the final recovery device in a recovery system:

a. A scrubbing liquid temperature monitoring device having an accuracy of ±1% of the temperature being monitored expressed in degrees Celsius or ±0.5°C, whichever is greater and a specific gravity monitoring device having an accuracy of 0.02 specific gravity units, each equipped with a continuous recorder;

b. An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization or thermal conductivity, each equipped with a continuous recorder.

2. Where a condenser is the final recovery device in a recovery system:

a. A condenser exit or product side temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1% of the temperature being monitoring expressed in degrees Celsius or 0.5°C, whichever is greater;

b. An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization or thermal conductivity, each equipped with a continuous recorder.

3. Where a carbon adsorber is the final recovery device in a recovery system:

a. An integrating steam flow monitoring device having an accuracy of 10% and a carbon bed temperature monitoring device having an accuracy of ±1% of the temperature being monitored expressed in degrees Celsius or ±0.5°C, whichever is greater, both equipped with a continuous recorder;

b. An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization or thermal conductivity, each equipped with a continuous recorder.

(e) An owner or operator of an affected facility seeking to demonstrate compliance with the standards specified under sub. (3) with control devices other than an incinerator, boiler, process heater or flare; or recovery devices other than an absorber, condenser or carbon adsorber shall provide to the administrator information describing the operation of the control device or recovery device and the process parameters which would indicate proper operation and maintenance of the device. The administrator may request further information and will specify appropriate monitoring procedures or requirements.

(5) TEST METHODS AND PROCEDURES. (a) For the purpose of demonstrating compliance with sub. (3), all affected facilities shall be run at full operating conditions and flow rates during any performance test.

(b) The following methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, except as provided under s. NR 440.08(2)(b), shall be used as reference methods to determine compliance with the emission limit or percent reduction efficiency specific under sub. (3)(a):

1. Method 1 or 1A, as appropriate, for selection of the sampling sites. The control device inlet sampling site for determination of vent stream molar composition or TOC (less methane and ethane) reduction efficiency shall be prior to the inlet of the control device and after the recovery system.

2. Method 2, 2A, 2C or 2D, as appropriate, for determination of the volumetric flow rates.

3. The emission rate correction factor, integrated sampling and analysis procedure of Method 3 shall be used to determine the oxygen concentration ($\%O_{2d}$) for the purposes of determining compliance with the 20 ppmv limit. The sampling site shall be the same as that of the TOC samples and the samples shall be taken during the same time that the TOC samples are taken.

The TOC concentration corrected to 3% O_2 (C_c) shall be computed using the following equations:

$$C_c = C_{TOC} \frac{17.9}{20.9 - \%O_{2d}}$$

where:

C_c is the concentration of TOC corrected to 3% O_2, dry basis, ppm by volume

C_{TOC} is the concentration of TOC (minus methane and ethane), dry basis, ppm by volume

$\%O_{2d}$ is the concentration of O_2, dry basis, percent by volume

4. Method 18 to determine concentration of TOC in the control device outlet and the concentration of TOC in the inlet when the reduction efficiency of the control device is to be determined.

a. The sampling time for each run shall be 1 hour in which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used then the samples shall be taken at 15-minute intervals.

b. The emission reduction (R) of TOC (minus methane and ethane) shall be determined using the following equation:

$$R = \frac{E_i - E_o}{E_i} \times 100$$

where:

R is the emission reduction, percent by weight

E_i is the mass rate of TOC entering the control device, kg TOC/hr

E_o is the mass rate of TOC discharged to the atmosphere, kg TOC/hr

c. The mass rates of TOC (E_i, E_o) shall be computed using the following equations:

$$E_i = K_2 \left(\sum_{j=1}^{n} C_{ij} M_{ij}\right) Q_i$$

$$E_o = K_2 \left(\sum_{j=1}^{n} C_{oj} M_{oj}\right) Q_o$$

where:

C_{ij} and C_{oj} are the concentration of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively

M_{ij} and M_{oj} are the molecular weight of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, g/g-mole (lb/lb-mole)

Q_i and Q_o are the flow rate of gas stream at the inlet and outlet of the control device, respectively, dscm/min (dscf/hr)

K_2 is a constant, 2.494×10^{-6} (1/ppm) (g-mole/scm) (kg/g) (min/hr), where standard temperature for (g-mole/scm) is 20°C

d. The TOC concentration (C_{TOC}) is the sum of the individual components and shall be computed for each run using the following equation:

$$C_{TOC} = \sum_{j=1}^{n} C_j$$

where:

C_{TOC} is the concentration of TOC (minus methane and ethane), dry basis, ppm by volume

C_j is the concentration of sample components in the sample

n is the number of components in the sample

5. When a boiler or process heater with a design heat input capacity of 44 MW (150 million Btu/hour) or greater is used to seek to comply with sub. (3)(a), the requirement for an initial performance test is waived, in accordance with s. NR 440.08(2). However, the department reserves the option to require testing at such other times as may be required.

(c) When a flare is used to seek to comply with sub. (3)(b), the flare shall comply with the requirements of s. NR 440.18.

(d) The following test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, except as provided under s. NR 440.08(2), shall be used for determining the net heating value of the gas combusted to determine compliance under sub. (3)(b) and for determining the process vent stream TRE index value to determine compliance under sub. (3)(c).

1. Method 1 or 1A, as appropriate, for selection of the sampling site. The sampling site for the vent stream flow rate and molar composition determination prescribed in subd. 3 and 4 shall be, except for the situations outlined in subd. 2, prior to the inlet of any control device, prior to any post-reactor dilution of the stream with air and prior to any post-reactor introduction of halogenated compounds into the vent stream. No transverse site selection method is needed for vents smaller than 4 inches in diameter.

2. If any gas stream other than the air oxidation vent stream from the affected facility is normally conducted through the final recovery device:

a. The sampling site for vent stream flow rate and molar composition shall be prior to the final recovery device and prior to the point at which the nonair oxidation stream is introduced.

b. The efficiency of the final recovery device is determined by measuring the TOC concentration using Method 18 at the inlet to the final recovery device after the introduction of any nonair oxidation vent stream and at the outlet of the final recovery device.

c. This efficiency is applied to the TOC concentration measured prior to the final recovery device and prior to the introduction of the nonair oxidation stream to determine the concentration of TOC in the air oxidation stream from the final recovery device. This concentration of TOC is then used to perform the calculations outlined in subd. 5 and 6.

3. The molar composition of the process vent stream shall be determined as follows:

a. Method 18 to measure the concentration of TOC including those containing halogens.

b. ASTM D1946-77, incorporation by reference in s. NR 440.17, to measure the concentration of carbon monoxide and hydrogen.

c. Method 4 to measure the content of water vapor.

4. The volumetric flow rate shall be determined using Method 2, 2A, 2C or 2D, as appropriate.

5. The net heating value of the vent stream shall be calculated using the following equation:

$$H_T = K_1 \left(\sum_{j=1}^{n} C_j H_j\right)$$

where:

H_T is the net heating value of the sample, MJ/scm, where the net enthalpy per mole of offgas is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C, as in the definition of Q_s (offgas flow rate)

K_1 is a constant, $1.740 \times 10^{-7} \ \frac{(1)}{\text{ppm}} \ \frac{(\text{g-mole})}{\text{scm}} \ \frac{(\text{MJ})}{\text{kcal}}$

where standard temperature for $\frac{(\text{g-mole})}{\text{scm}}$ is 20°C

C_j is the concentration of compound j in ppm, as measured for organics by Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-77, incorporated by reference in s. NR 440.17, as indicated in subd 3

H_j is the net heat of combustion j, kcal/g-mole, based on combustion at 25°C and 760 mm Hg. The heats of combustion of vent stream components would be required to be determined using ASTM D2382-76, incorporation by reference as specified in s. NR 440.17, if published values are not available or cannot be calculated

6. The emission rate of TOC in the process vent stream shall be calculated using the following equation:

$$E_{TOC} = K_2 \left(\sum_{j=1}^{n} C_j M_j\right) Q_s$$

where:

E_{TOC} is the emission rate of TOC in the sample, kg/hr

K_2 is the constant, 2.494×10^{-6} (1/ppm) (g-mole/scm) (kg/g) (min/hr), where standard temperature for (g-mole/scm) is 20°C

C_j is the concentration on a basis of compound j in ppm as measured by Method 18 as indicated in subd. 3

M_j is the molecular weight of sample j, g/g-mole

Q_s is the vent stream flow rate (scm/min) at a standard temperature of 20°C

7. The total process vent stream concentration (by volume) of compounds containing halogens (ppmv, by compound) shall be summed from the individual concentrations of compounds containing halogens which were measured by Method 18.

(e) For purposes of complying with sub. (3)(c), the owner or operator of a facility affected by this section shall calculate the TRE index value of the vent stream using the equation for incineration in subd. 1 for halogenated vent streams. The owner or operator of an affected facility with a nonhalogenated vent stream shall determine the TRE index value by calculating values using both the incinerator equation in subd. 1 and the flare equation in subd. 2 and selecting the lower of the 2 values.

1. The TRE index value of the vent stream controlled by an incinerator shall be calculated using the following equation:

$$TRE = \frac{1}{E_{TOC}} \left[a + b\,(Q_s)^{0.88} + c(Q_s) + d(Q_s)(H_T) + e(Q_s)^{0.88}(H_T)^{0.88} + f(Y_s)^{0.5}\right]$$

a. Where for a vent stream flow rate (scm/min) at a standard temperature of 20°C that is greater than or equal to 14.2 scm/min:

TRE is the TRE index value

Q_s is the vent stream flow rate (scm/min), at a standard temperature of 20°C

H_T is the vent stream net heating value (MJ/scm), where the net enthalpy of combustion per mole of vent stream is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C, as in the definition of Q_s

Y_s is the Q_s for all vent stream categories listed in Table 1 except for Category E vent streams where $Y_s = (Q_s)(H_T)/3.6$

E_{TOC} is the hourly emissions of TOC reported in kg/hr

a, b, c, d, e and f are coefficients

The set of coefficients which apply to a vent stream shall be obtained from Table 1.

TABLE 1. AIR OXIDATION NSPS TRE COEFFICIENTS FOR VENT STREAMS CONTROLLED BY AN INCINERATOR

DESIGN CATEGORY A1. FOR HALOGENATED PROCESS VENT STREAMS, IF $0 \leq$ NET HEATING VALUE (MJ/scm) ≤ 3.5:

Q_s = Vent Stream Flow Rate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 18.8$	19.18370	0.27580	0.75762	−0.13064	0	0.01025
$18.8 < Q_s \leq 699$	20.00563	0.27580	0.30387	−0.13064	0	0.01025
$699 < Q_s \leq 1400$	39.87022	0.29973	0.30387	−0.13064	0	0.01449
$1400 < Q_s \leq 2100$	59.73481	0.31467	0.30387	−0.13064	0	0.01775
$2100 < Q_s \leq 2800$	79.59941	0.32572	0.30387	−0.13064	0	0.02049
$2800 < Q_s \leq 3500$	99.46400	0.33456	0.30387	−0.13064	0	0.02291

DESIGN CATEGORY A2. FOR HALOGENATED PROCESS VENT STREAMS, IF NET HEATING VALUE > 3.5 MJ/SCM:

Q_s = Vent Stream Flow Rate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 18.8$	18.84466	0.26742	−0.20044	0	0	0.01025
$18.8 < Q_s \leq 699$	19.66658	0.26742	−0.25332	0	0	0.01025
$699 < Q_s \leq 1400$	39.19213	0.29062	−0.25332	0	0	0.01449
$1400 < Q_s \leq 2100$	58.71768	0.30511	−0.25332	0	0	0.01775
$2800 < Q_s \leq 3500$	78.24323	0.31582	−0.25332	0	0	0.02049
	97.76879	0.32439	−0.25332	0	0	0.02291

DESIGN CATEGORY B. FOR NONHALOGENATED PROCESS VENT STREAMS, IF $0 \leq$ NET HEATING VALUE (MJ/SCM) ≤ 0.48:

Q_s = Vent Stream Flow Rate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 1340$	8.54245	0.10555	0.09030	−0.17109	0	0.01025
$1340 < Q_s \leq 2690$	16.94386	0.11470	0.09030	−0.17109	0	0.01449
$2690 < Q_s \leq 4040$	25.34528	0.12042	0.09030	−0.17109	0	0.01775

DESIGN CATEGORY C. FOR NONHALOGENATED PROCESS VENT STREAMS, IF $0.48 <$ NET HEATING VALUE (MJ/SCM) ≤ 1.9:

Q_s = Vent Stream Flow Rate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 1340$	9.25233	0.06105	0.31937	−0.16181	0	0.01025
$1340 < Q_s \leq 2690$	18.36363	0.06635	0.31937	−0.16181	0	0.01449
$2690 < Q_s \leq 4040$	27.47492	0.06965	0.31937	−0.16181	0	0.01775

DESIGN CATEGORY D. FOR NONHALOGENATED PROCESS VENT STREAMS, IF $1.9 <$ NET HEATING VALUE (MJ/SCM) ≤ 3.6:

Q_s = Vent Stream Flow Rate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 1180$	6.67868	0.06943	0.02582	0	0	0.01025
$1180 < Q_s \leq 2370$	13.21633	0.07546	0.02582	0	0	0.01449
$2370 < Q_s \leq 3550$	19.75398	0.07922	0.02582	0	0	0.01775

DESIGN CATEGORY E. FOR NONHALOGENATED PROCESS VENT STREAMS, IF NET HEATING VALUE > 3.6 MJ/SCM:

Y_s = Dilution Flow Rate (scm/min) = (Q_s) $(H_T)/3.6$	a	b	c	d	e	f
$14.2 \leq Y_s \leq 1180$	6.67868	0	0	−0.00707	0.02220	0.01025
$1180 < Y_s \leq 2370$	13.21633	0	0	−0.00707	0.02412	0.01449
$2370 < Y_s \leq 3550$	19.75398	0	0	−0.00707	0.02533	0.01775

b. Where for a vent stream flow rate (scm/min) at a standard temperature of 20°C that is less than 14.2 scm/min:

TRE is the TRE index value

$Q_s = 14.2$ scm/min

H_T is the (FLOW)(HVAL)/14.2

where the following inputs are used:

FLOW is the vent stream flow rate (scm/min), at a standard temperature of 20°C

HVAL is the vent stream net heating value (MJ/scm), where the net enthalpy per mole of vent stream is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mole is 20°C as in the definition of Q_s

$Y_s = 14.2$ scm/min for all vent stream categories listed in Table 1 except for Category E vent streams, where $Y_s = (14.2)(H_T)/3.6$

E_{TOC} is the hourly emissions of TOC reported in kg/hr

a,b,c,d,e and f are coefficients

The set of coefficients that apply to a vent stream shall be obtained from Table 1.

2. The equation for calculating the TRE index value of a vent stream controlled by a flare is as follows:

$$TRE = \frac{1}{E_{TOC}} [a(Q_s) + b(Q_s)^{0.8} + c(Q_s)(H_T) + d(E_{TOC}) + e]$$

where:

TRE is the TRE index value

E_{TOC} is the hourly emission rate of TOC reported in kg/hr

Q_s is the vent stream flow rate (scm/min) at a standard temperature of 20°C

H_T is the vent stream net heating value (MJ/scm) where the net enthalpy per mole of offgas is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mole is 20°C as in the definition of Q_s

a,b,c,d and e are coefficients

The set of coefficients that apply to a vent stream shall be obtained from Table 2.

TABLE 2 - AIR OXIDATION PROCESSES NSPS TRE COEFFICIENTS FOR VENT STREAMS CONTROLLED BY A FLARE

	a	b	c	d	e
H_T < 11.2 MJ/scm	2.25	0.288	−0.193	−0.0051	2.08
H_T > 11.2 MJ/scm	0.309	0.0619	−0.0043	−0.0034	2.08

(f) Each owner or operator of an affected facility seeking to comply with sub. (1)(c) or (3)(c) shall recalculate the TRE index value for that affected facility whenever process changes are made. Some examples of process changes are changes in production capacity, feedstock type or catalyst type or whenever there is replacement, removal or addition of recovery equipment. The TRE index value shall be recalculated based on test data or on best engineering estimates of the effects of the change to the recovery system.

1. Where the recalculated TRE index value is less than or equal to 1.0, the owner or operator shall notify the department within 1 week of the recalculation and shall conduct a performance test according to the methods and procedures required by sub. (5) to determine compliance with sub. (3)(a). Performance tests shall be conducted as soon as possible after the process change but no later than 180 days from the time of the process change.

2. Where the initial TRE index value is greater than 4.0 and the recalculated TRE index value is less than or equal to 4.0, but greater than 1.0, the owner or operator shall conduct a performance test in accordance with s. NR 440.08 and this subsection, and shall comply with subs. (4) and (6) and this subsection. Performance tests shall be conducted as soon as possible after the process change but no later than 180 days from the time of the process change.

(6) REPORTING AND RECORDKEEPING REQUIREMENTS. (a) Each owner or operator subject to sub. (3) shall notify the department of the specific provisions of sub. (3) with which the owner or operator has elected to comply. Notification shall be submitted with the notification of initial startup required by s. NR 440.07(1)(c). If an owner or operator elects at a later date to use an alternative provision of sub. (3) with which he or she will comply, then the department shall be notified by the owner or operator 90 days before implementing a change and, upon implementing the change, a performance test shall be performed as specified by sub. (5) within 180 days.

(b) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible records of the following data measured during each performance test and also include the following data in the report of the initial performance test required under s. NR 440.08. Where a boiler or process heater with a design heat input capacity of 44 MW (150 million Btu/hour) or greater is used to comply with sub. (3)(a), a report containing performance test data need not be submitted, but a report containing the information of subd. 2 a is required. The same data specified in this subsection shall be submitted in the reports of all subsequently required performance tests where either the emission control efficiency of a control device, outlet concentration of TOC or the TRE index value of a vent stream from a recovery system is determined.

1. Where an owner or operator subject to this section seeks to demonstrate compliance with sub. (3)(a) through use of either a thermal or catalytic incinerator:

a. The average firebox temperature of the incinerator, or the average temperature upstream and downstream of the catalyst bed for a catalytic incinerator, measured at least every 15 minutes and averaged over the same time period of the performance testing, and

b. The percent reduction of TOC determined as specified in sub. (5)(b) achieved by the incinerator or the concentration of TOC (ppmv, by compound) determined as specified in sub. (5)(b) at the outlet of the control device on a dry basis corrected to 3% oxygen.

2. Where an owner or operator subject to the provisions of this section seeks to demonstrate compliance with sub. (3)(a) through use of a boiler or process heater:

a. A description of the location at which the vent stream is introduced into the boiler or process heater, and

b. The average combustion temperature of the boiler or process heater with a design heat input capacity of less than 44 MW (150 million Btu/hr) measured at least every 15 minutes and averaged over the same time period of the performance testing.

3. Where an owner or operator subject to the provisions of this section seeks to comply with sub. (3)(b) through the use of a smokeless flare, flare design, that is, steam-assisted, air-assisted or nonassisted, all visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the performance test, continuous

records of the flare pilot flame monitoring and records of all periods of operations during which the pilot flame is absent.

4. Where an owner or operator seeks to demonstrate compliance with sub. (3)(c).

a. Where an absorber is the final recovery device in a recovery system, the exit specific gravity or alternative parameter which is a measure of the degree of absorbing liquid saturation, if approved by the department and average exit temperature of the absorbing liquid, measured at least every 15 minutes and averaged over the same time period of the performance testing, both measured while the vent stream is normally routed and constituted; or

b. Where a condenser is the final recovery device in a recovery system, the average exit, that is, product side, temperature, measured at least every 15 minutes and average over the same time period of the performance testing while the vent stream is normally routed and constituted.

c. Where a carbon adsorber is the final recovery device in a recovery system, the total steam mass flow measured at least every 15 minutes and averaged over the same time period of the performance test, that is, full carbon bed cycle, temperature of the carbon bed after regeneration, and within 15 minutes of completion of any cooling cycle, and duration of the carbon bed steaming cycle, all measured while the vent stream is normally routed and constituted; or

d. As an alternative to subpar. a, b or c, the concentration level or reading indicated by the organic monitoring device at the outlet of the absorber, condenser or carbon adsorber measured at least every 15 minutes and averaged over the same time period of the performance testing while the vent stream is normally routed and constituted.

e. All measurements and calculations performed to determine the TRE index value of the vent stream.

(c) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under sub. (4)(a) and (c) as well as up-to-date, readily accessible records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The department may at any time require a report of these data. Where a combustion device is used by an owner or operator seeking to demonstrate compliance with sub. (3)(a) or (c), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

1. For thermal incinerators, all 3-hour periods of operation during which the average combustion temperature was more than 28°C (50°F) below the average temperature of the vent stream during the most recent performance test at which compliance with sub. (3)(a) was determined.

2. For catalytic incinerators, all 3-hour periods of operation during which the average temperature of the vent stream immediately before the catalyst bed is more than 28°C (50°F) below the average temperature of the vent stream during the most recent performance test at which compliance with sub. (3)(a) was determined. The owner or operator also shall record all 3-hour periods of operation during which the average temperature difference across the catalyst bed is less than 80% of the average temperature difference of the device during the most recent performance test at which compliance with sub. (3)(a) was determined.

3. All 3-hour periods of operation during which the average combustion temperature was more than 28°C (50°F) below the average combustion temperature during the most recent performance test at which compliance with sub. (3)(a) was determined for boilers or process heaters with a design heat input capacity of less than 44 MW (150 million Btu/hr).

4. For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under sub. (3)(a).

(d) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible continuous records of the flow indication specified under sub. (4)(a)2, (b)2 and (c)1 as well as up-to-date, readily accessible records of all periods when the vent stream is diverted from the control device or has no flow rate.

(e) Each owner or operator subject to the provisions of this section who uses a boiler or process heater with a design heat input capacity of 44 MW or greater to comply with sub. (3)(a) shall keep an up-to-date, readily accessible record of all periods of operation of the boiler or process heater.

Note: Examples of such records could include records of steam use, fuel use or monitoring data collected pursuant to other state or federal regulatory requirements.

(f) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible continuous records of the flare pilot flame monitoring specified in sub. (4)(b), as well as up-to-date, readily accessible records of all periods of operations in which the pilot flame is absent.

(g) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under sub. (4)(c) as well as up-to-date, readily accessible records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The department may at any time require a report of these data. Where the owner or operator seeks to demonstrate compliance with sub. (3)(c), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

1. Where an absorber is the final recovery device in a recovery system and where an organic monitoring device is not used:

a. All 3-hour periods of operation during which the average absorbing liquid temperature was more than 11°C (20°F) above the average absorbing liquid temperature during the most recent performance test or

b. All 3-hour periods of operation during which the average absorbing liquid specific gravity was more than 0.1 unit above or more than 0.1 unit below, the average absorbing liquid specific gravity during the most recent performance test, unless monitoring of an alternative parameter, which is a measure of the degree of absorbing liquid saturation, is approved by the department, in which case the department will define appropriate parameter boundaries and periods of operation during which they are exceeded.

2. When a condenser is the final recovery device in a recovery system and where an organic monitoring device is not used, all 3-hour periods of operation during which the average exit or product side condenser operating temperature was more than 6°C (11°F) above the average exit (product side) operating temperature during the most recent performance test.

3. Where a carbon adsorber is the final recovery device in a recovery system and where an organic monitoring device is not used:

a. All carbon bed regeneration cycles during which the total mass steam flow was more than 10% below the total mass steam flow during the most recent performance test; or

b. All carbon bed regeneration cycles during which the temperature of the carbon bed after regeneration, and after completion of any cooling cycle, was more than 10% greater than the carbon bed temperature, in degrees Celsius, during the most recent performance test.

4. Where an absorber, condenser or carbon adsorber is the final recovery device in the recovery system and an organic monitoring device approved by the department is used, all 3-hour periods of operation during which the average concentration level or reading of organic compounds in the exhaust gases is more than 20% greater than the exhaust gas organic compound concentration level or reading measured by the monitoring device during the most recent performance test.

(h) Each owner or operator subject to the provisions of this section and seeking to demonstrate compliance with sub. (3)(c) shall keep up-to-date, readily accessible records of:

1. Any changes in production capacity, feedstock type or of any replacement, removal or addition of recovery equipment or air oxidation reactors;

2. Any recalculation of the TRE index value performed pursuant to sub. (5)(f);

3. The results of any performance test performed pursuant to the methods and procedures required by sub. (5)(d).

(i) Each owner and operator subject to the provisions of this section is exempt from the quarterly reporting requirements contained in s. NR 440.07(3).

(j) Each owner or operator that seeks to comply with the requirements of this section by complying with the requirements of sub. (3) shall submit to the department semiannual reports of the following information. The initial report shall be submitted within 6 months after the initial startup date.

1. Exceedances of monitored parameters recorded under pars. (c) and (g).

2. All periods recorded under par. (d) when the vent stream is diverted from the control device or has no flow rate.

3. All periods recorded under par. (e) when the boiler or process heater was not operating.

4. All periods recorded under par. (f) in which the pilot flame of the flare was absent.

5. Any recalculation of the TRE index value, as recorded under par. (h).

Note: The requirements of par. (j) remain in force until and unless EPA, in delegating enforcement authority to a state under section 111(c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such state. In that event, affected sources within the state will be relieved of the obligation to comply with par. (j), provided that they comply with the requirements established by the state.

(l) The department will specify appropriate reporting and recordkeeping requirements where the owner or operator of an affected facility seeks to demonstrate compliance with the standards specified under sub. (3) other than as provided under sub. (4)(a) to (d).

(7) RECONSTRUCTION. (a) For purposes of this section "fixed capital cost of the new components", as used in s. NR 440.15, includes the fixed capital cost of all depreciable components which are or will be replaced pursuant to all continuous programs of components which are commenced within any 2-year period following October 21, 1983. For purposes of this paragraph, "commenced" means that an owner or operator has undertaken a continuous program of component replacement or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of component replacement.

(8) CHEMICALS AFFECTED BY THIS SECTION.

Chemical Name	CAS No.*
Acetaldehyde	75-07-0
Acetic Acid	64-19-7
Acetone	67-64-1
Acetonitrile	75-05-8
Acetophenone	98-86-2
Acrolein	107-02-8
Acrylic acid	79-10-7
Acrylonitrile	107-13-1
Anthraquinone	84-65-1
Benzaldehyde	100-52-7
Benzoic acid, tech	65-85-0
1,3-Butadiene	106-99-0
p-t-Butyl benzoic acid	98-73-7
N-Butyric acid	107-92-6
Crotonic acid	3724-65-0
Cumene hydroperoxide	80-15-9
Cyclohexanol	108-93-0
Cyclohexanone	108-94-1
Dimethyl terephthalate	120-61-6
Ethylene dichloride	107-06-2
Ethylene oxide	75-21-8
Formaldehyde	50-00-0
Formic acid	64-18-6
Glyoxal	107-22-2
Hydrogen cyanide	74-90-8
Isobutyric acid	79-31-2
Isophthalic acid	121-91-5
Maleic anhydride	108-31-6
Methyl ethyl ketone	78-93-3
α-Methyl styrene	98-83-9
Phenol	108-95-2
Phthalic anhydride	85-44-9
Propionic acid	79-09-4
Propylene oxide	75-56-9
Styrene	100-42-5
Terephthalic acid	100-21-0

*CAS numbers refer to the Chemical Abstracts Registry numbers assigned to specific chemicals, isomers or mixtures of chemicals. Some isomers or mixtures that are covered by the standards do not have CAS numbers assigned to them. The standards apply to all of the chemicals listed, whether CAS numbers have been assigned or not.

SECTION 169. NR 440.682(4)(b)3.a. is amended to read:

NR 440.682(4)(b)3.a. When a leak is detected, it shall be repaired as soon as ~~practical~~ practicable, but no later than 15 calendar days after it is detected except as provided in s. NR 440.62(3)(i).

SECTION 170. NR 440.684(2)(a)4. is amended to read:

NR 440.684(2)(a)4. "Reduced sulfur compounds" means hydrogen sulfide (H_2S), carbonyl sulfide (COS) and carbon disulfide (CS_2).

SECTION 171. NR 440.684(2)(b)4. to 6. are renumbered NR 440.684(2)(b)5. to 7.

SECTION 172. NR 440.684(2)(b)4. is created to read:

NR 440.684(2)(b)4. "TRS" = the total concentration of reduced sulfur compounds as determined by Method 15 of Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, if the source is a reduction-type device or the concentration of total reduced sulfur compounds as determined by Method 16A of Appendix A of 40 CFR part 60 if the source is an oxidation-type device.

SECTION 173. NR 440.684(4)(b) is amended to read:

NR 440.684(4)(b) The emission reduction efficiency (R) achieved by the sulfur recovery technology ~~is calculated by using the equation:~~

$$\cancel{R = \frac{S}{S+E} \times 100}$$

~~"S" and "E" are determined using the procedures and test methods specified in subs. (5) and (6).~~ shall be determined using the procedures in sub. (5)(c)1.

SECTION 174. NR 440.684(5) is repealed and recreated to read:

NR 440.684(5) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17 or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) During a performance test required by s. NR 440.08, the owner or operator shall determine the minimum required reduction efficiencies (Z) of SO_2 emissions as required in sub. (3)(a) and (b) as follows:

1. The average sulfur feed rate (X) shall be computed as follows:

$$X = K Q_a Y$$

where:

X is the average sulfur feed rate, long ton/day

Q_a is the average volumetric flow rate of acid gas from sweetening unit, dscf/day

Y is the average H_2S concentration in acid gas feed from sweetening unit, percent by volume

K = (32 lb S/lb-mole)/[(100%)(385.36 dscf/lb-mole)(2240 lb/long ton)]
= 3.707×10^{-7}

2. The continuous readings from the process flowmeter shall be used to determine the average volumetric flow rate (Q_a) in dscf/day of the acid gas from the sweetening unit for each run.

3. The Tutwiler procedure in sub. (9) or a chromatographic procedure following ASTM E260-73, incorporated by reference in s. NR 440.17, shall be used to determine the H_2S concentration in the acid gas feed from the sweetening unit. At least one sample per hour, at equally spaced intervals, shall be taken during each 4-hour run. The arithmetic mean of all samples shall be the average H_2S concentration (Y) on a dry basis for the run. By multiplying the result from the Tutwiler procedure by 1.62×10^{-3}, the units gr/100 scf are converted to volume percent.

4. Using the information from par. (b)1 and 3, Tables 1 and 2 shall be used to determine the required initial (Z_i) and continuous (Z_c) reduction efficiencies of SO_2 emissions.

(c) The owner or operator shall determine compliance with the SO_2 standards in sub. (3)(a) or (b) as follows:

1. The emission reduction efficiency (R) achieved by the sulfur recovery technology shall be computed for each run using the following equation:

$$R = (100\ S)/(S + E)$$

2. The level indicators or manual soundings shall be used to measure the liquid sulfur accumulation rate in the product storage tanks. Readings taken at the beginning and end of each run, the tank geometry, sulfur density at the storage temperature and sample duration shall be used to determine the sulfur production rate (S) in kg/hr for each run.

3. The emission rate (E) of sulfur shall be computed for each run as follows:

$$E = C_e\ Q_{sd}/K$$

where:

C_e is the concentration of sulfur equivalent (SO_2 + TRS), g/dscm

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr

K is the conversion factor, 1000 g/kg

4. The concentration (C_e) of sulfur equivalent shall be the sum of the SO_2 and TRS concentrations, after being converted to sulfur equivalents. For each run and each of the test methods specified in par. (c), the sampling time shall be at least 4 hours. Method 1 shall be used to select the sampling site. The sampling point in the duct shall be at the centroid of the cross-section if the area is less than 5 m^2 (54 ft^2) or at a point no closer to the walls than 1 m (39 in.) if the cross-sectional area is 5 m^2 or more and the centroid is more than 1 m (39 in.) from the wall.

a. Method 6 shall be used to determine the SO_2 concentration. Eight samples of 20 minutes each shall be taken at 30-minute intervals. The arithmetic average in mg/dscm shall be the concentration for the run. The concentration in mg/dscm shall be multiplied by 0.5×10^{-3} to convert the results to sulfur equivalent.

b. Method 15 shall be used to determine the TRS concentration from reduction-type devices or where the oxygen content of the effluent gas is less than 1.0% by volume. The sampling rate shall be at least 3 liters/min (0.1 ft^3/min) to insure minimum residence time in the sample line. Sixteen samples shall be taken at 15-minute intervals. The arithmetic average of all the samples shall be the concentration for the run. The concentration in ppm TRS as SO_2 shall be multiplied by 1.352×10^{-3} to convert the results to sulfur equivalent.

c. Method 16A shall be used to determine the TRS concentration from oxidation-type devices or where the oxygen content of the effluent gas is greater than 1.0% by volume. Eight samples of 20 minutes each shall be taken at 30-minute intervals. The arithmetic average shall be the concentration for the run. The concentration in ppm TRS as H_2S shall be multiplied by 1.352×10^{-3} to convert the results to sulfur equivalent.

d. Method 2 shall be used to determine the volumetric flow rate of the effluent gas. A velocity traverse shall be conducted at the beginning and end of each run. The arithmetic average of the 2 measurements shall be used to calculate the volumetric flow rate (Q_{sd}) for the run. For the determination of the effluent gas molecular weight, a single integrated sample over the 4-hour period may be taken and analyzed or grab samples at 1-hour intervals may be taken, analyzed and averaged. For the moisture content, 2 samples of at least 0.10 dscm (0.35 dscf) and 10 minutes shall be taken at the beginning of the 4-hour run and near the end of the time period. The arithmetic average of the 2 runs shall be the moisture content for the run.

(d) To comply with sub. (7)(d), the owner or operator shall obtain the information required by using the monitoring devices in par. (b) or (c).

SECTION 175. NR 440.684(6) is repealed.

SECTION 176. NR 440.684(7)(a)2. and 4., (b)3., (c), (d)(intro.) and (e) and (8)(a) are amended to read:

NR 440.684(7)(a)2. The H_2S concentration in the acid gas from the sweetening unit for each 24-hour period: At least one sample per 24-hour period shall be collected and analyzed using the method specified in sub. ~~(6)(a)8.~~ (5)(b)3. The department may require the owner or operator to demonstrate that the H_2S concentration obtained from one or more samples over a 24-hour period is within ±20% of the average of 12 samples collected at equally spaced intervals during the 24-hour period. In instances where the H_2S concentration of a single sample is not within ±20% of the average of the 12 equally spaced samples, the department may require a more frequent sampling schedule.

4. The sulfur feed rate (X): For each 24-hour period, X shall be computed using the equation in sub. ~~(5)(a)4.~~ (5)(b)1.

(b)3. ~~Upon promulgation of a performance specification of continuous monitoring systems for total reduced sulfur compounds at sulfur recovery plants, the~~ The owner or operator may, as an alternative to subd. 2, install, calibrate, maintain and operate a continuous emission monitoring system for total reduced sulfur compounds as required in par. (d) in addition to a sulfur dioxide emission monitoring system. The sum of the equivalent sulfur mass emission rates from the 2 monitoring systems shall be used to compute the total sulfur emission rate (E).

(c) Where compliance is achieved through the use of a reduction control system not followed by a continually operated incineration device, the owner or operator shall install, calibrate, maintain and operate a continuous monitoring system to measure the emission rate of reduced sulfur compounds as SO_2 equivalent in the gases discharged to the atmosphere. The SO_2 equivalent compound emission rate shall be expressed in terms of equivalent sulfur mass flow rates (kg/hr). The span of this monitoring system shall be set so that the equivalent emission limit of sub. (3)(b) will be between 30 and 70% of the measurement range of the system. ~~This requirement becomes effective upon promulgation of a performance specification for continuous monitoring systems for total reduced sulfur compounds at sulfur recovery plants.~~

(d)(intro.) For those sources required to comply with pars. (b) and (c), the average sulfur emission reduction efficiency achieved (R) shall be calculated for each 24-hour clock interval. The 24-hour interval may begin and end at any selected clock time but shall be consistent. The 24-hour average reduction efficiency (R) shall be computed based on the 24-hour average sulfur production rate (S) and sulfur emission rate (E) using the equation in sub. ~~(4)(b).~~ (5)(c)1.

(e) In lieu of complying with par. (b) or (c), those sources with a design capacity of less than 150 LT/D of H_2S expressed as sulfur may calculate the sulfur emission reduction efficiency achieved for each 24-hour period by:

$$R = \frac{0.0236\ S}{X}\ (100\ \%)$$

where:

R - is the sulfur dioxide removal efficiency achieved during the 24-hour period, percent

S - ~~The~~ is the sulfur production rate during the 24-hour period, kg/hr

X - is the sulfur feed rate in the acid gas LT/D

0.0236 - is the conversion factor, LT/D per kg/hr

(8)(a) Records of the calculations and measurements required in subs. (3)(a) and (b) and (7)(a) to (g) shall be retained for at least 2 years following the date of the measurements by owners and operators subject to this section. This requirement is included under s. NR ~~440.07(4)~~ 440.07(5).

SECTION 177. NR 440.686 is created to read:

NR 440.686 VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS FROM SYNTHETIC ORGANIC CHEMICAL MANUFACTURING INDUSTRY (SOCMI) DISTILLATION OPERATIONS.

(1) APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY. (a) The provisions of this section apply to each affected facility designated in par. (b) that is part of a process unit that produces any of the chemicals listed in sub. (8) as a product, co-product, by-product or intermediate, except as provided in par. (c).

(b) The affected facility is any of the following for which construction, modification or reconstruction commenced after December 30, 1983:

1. Each distillation unit not discharging its vent stream into a recovery system.

2. Each combination of a distillation unit and the common recovery system into which its vent stream is discharged.

3. Each combination of 2 or more distillation units and the common recovery system into which their vent streams are discharged.

(c) Exemptions from the provisions of par. (a) are as follows:

1. Any distillation unit operating a part of a process unit which produces coal tar or beverage alcohols or which uses, contains and produces no VOC is not an affected facility.

2. Any distillation unit that is subject to the provisions of s. NR 440.647 is not an affected facility.

3. Any distillation unit that is designed and operates as a batch operation is not an affected facility.

4. Each affected facility that has a total resource effectiveness (TRE) index value greater than 8.0 is exempt from all provisions of this section except for subs. (3), (5)(d), (e) and (f) and (6)(h) and (1).

5. Each affected facility in a process unit with a total design capacity for all chemicals produced within that unit of less than one gigagram per year is exempt from all provisions of this section except for the recordkeeping and reporting requirements in sub. (6)(j), (1)6 and (n).

6. Each affected facility operated with a vent stream flow rate less than 0.008 scm/min is exempt from all provisions of this section except for the

test method and procedure and the recordkeeping and reporting requirements in subs. (5)(g) and (6)(i), (1)5 and (o).

Note: The intent of these standards is to minimize the emissions of VOC through the application of best demonstrated technology (BDT). The numerical emission limits in these standards are expressed in terms of total organic compounds (TOC), measured as TOC less methane and ethane. This emission limit reflects the performance of BDT.

(2) DEFINITIONS. (a) As used in this section, all terms not defined here shall have the meaning given them in s. NR 440.02 and the following terms shall have the specific meanings given them:

1. "Batch distillation operation" means a noncontinuous distillation operation in which a discrete quantity or batch of liquid feed is charged into a distillation unit and distilled at one time. After the initial charging of the liquid feed, no additional liquid is added during the distillation operation.

2. "Boiler" means any enclosed combustion device that extracts useful energy in the form of steam.

3. "By compound" means by individual steam components, not carbon equivalents.

4. "Continuous recorder" means a data recording device recording an instantaneous data value at least once every 15 minutes.

5. "Distillation operation" means an operation separating one or more feed streams into 2 or more exit streams, each exit stream having component concentrations different from those in the feed streams. The separation is achieved by the redistribution of the components between the liquid and vapor-phase as they approach equilibrium within the distillation unit.

6. "Distillation unit" means a device or vessel in which distillation operations occur, including all associated internals, such as trays or packing, and accessories, such as reboiler, condenser, vacuum pump, steam jet or other similar device, plus any associated recovery system.

7. "Flame zone" means the portion of the combustion chamber in a boiler occupied by the flame envelope.

8. "Flow indicator" means a device which indicates whether gas flow is present in a vent stream.

9. "Halogenated vent stream" means any vent stream determined to have a total concentration (by volume) of compounds containing halogens of 20 ppmv (by compound) or greater.

10. "Incinerator" means any enclosed combustion device that is used for destroying organic compounds and does not extract energy in the form of steam or process heat.

11. "Process heater" means a device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that is heated to produce steam.

12. "Process unit" means equipment assembled and connected by pipes or ducts to produce, as intermediates or final products, one or more of the chemicals in sub. (8). A process unit can operate independently if supplied with sufficient fuel or raw materials and sufficient product storage facilities.

13. "Product" means any compound or chemical listed in sub. (8) that is produced for sale as a final product as that chemical or for use in the production of other chemicals or compounds. By-products, co-products and intermediates are considered to be products.

14. "Recovery device" means an individual unit of equipment, such as an absorber, carbon adsorber or condenser, capable of and used for the purpose of recovering chemicals for use, reuse or sale.

15. "Recovery system" means an individual recovery device or series of such devices applied to the same vent stream.

16. "Total organic compounds" or "TOC" means those compounds measured according to the procedures in sub. (5)(b)4. For the purposes of measuring molar composition as required in sub. (5)(d)2 a; hourly emission rate as required in sub. (5)(d)5 and (e); and TOC concentration as required in sub. (6)(b)4 and (g)4, those compounds which the department has determined do not contribute appreciably to the formation of ozone are to be excluded. The compounds to be excluded are identified in s. NR 400.02(100).

17. "TRE index value" means a measure of supplemental total resource requirement per unit reduction of TOC associated with an individual distillation vent stream, based on vent stream flow rate, emission rate of TOC net heating, value and corrosion properties, whether or not the vent stream is halogenated, as quantified by the equation given under sub. (5)(e).

18. "Vent stream" means any gas stream discharged directly from a distillation facility to the atmosphere or indirectly to the atmosphere after diversion through other process equipment. The vent stream excludes relief valve discharges and equipment leaks including, but not limited to, pumps, compressors and valves.

(3) STANDARDS. Each owner or operator of any affected facility shall comply with par. (a), (b) or (c) for each vent stream on and after the date on which the initial performance test required by s. NR 440.08 and sub. (5) is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated or 180 days after the initial startup, whichever date comes first. Each owner or operator shall either:

(a) Reduce emission of TOC, less methane and ethane, by 98 weight-percent or to a TOC, less methane and ethane, concentration of 20 ppmv, on a dry basis corrected to 3% oxygen, whichever is less stringent. If a boiler or proces heater is used to comply with this paragraph, then the vent stream shall be introduced into the flame zone of the boiler or process heater; or

(b) Combust the emissions in a flare that meets the requirements of s. NR 440.18; or

(c) Maintain a TRE index value greater than 1.0 without use of VOC emission control devices.

(4) MONITORING OF EMISSIONS AND OPERATIONS. (a) The owner or operator of an affected facility that uses an incinerator to seek to comply with the TOC emission limit specified under sub. (3) shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment:

1. A temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1% of the temperature being monitored expressed in degrees Celsius or ±0.5°C, whichever is greater.

a. Where an incinerator other than a catalytic incinerator is used, a temperature monitoring device shall be installed in the firebox.

b. Where a catalytic incinerator is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.

2. A flow indicator that provides a record of vent stream flow to the incinerator at least once every hour for each affected facility. The flow indicator shall be installed in the vent stream from each affected facility at a point closest to the inlet of each incinerator and before being joined with any other vent stream.

(b) The owner or operator of an affected facility that uses a flare to seek to comply with sub. (3)(b) shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment:

1. A heat sensing device, such as a ultra-violet beam sensor or thermocouple, at the pilot light to indicate the continuous presence of a flame.

2. A flow indicator that provides a record of vent stream flow to the flare at least once every hour for each affected facility. The flow indicator shall be installed in the vent stream from each affected facility at a point closest to the flare and before being joined with any other vent stream.

(c) The owner or operator of an affected facility that uses a boiler or process heater to seek to comply with sub. (3)(a) shall install, calibrate, maintain and operate according to the manufacturer's specifications in the following equipment:

1. A flow indicator that provides a record of vent stream flow to the boiler or process heater at least once every hour for each affected facility. The flow indicator shall be installed in the vent stream from each distillation unit within an affected facility at a point closest to the inlet of each boiler or process heater and before being joined with any other vent stream.

2. A temperature monitoring device in the firebox equipped with a continuous recorder and having an accuracy of ±1% of the temperature being measured, expressed in degrees Celsius or ±0.5°C, whichever is greater, for boilers or process heaters of less than 44 MW (150 million Btu/hr) heat input design capacity.

3. Monitor and record the periods of operation of the boiler or proces heater if the design heat input capacity of the boiler or process heater is 44 MW (150 million Btu/hr) or greater. The records shall be readily available for inspection.

(d) The owner or operator of an affected facility that seeks to comply with the TRE index value limit specified under sub. (3)(c) shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment, unless alternative monitoring procedures or requirements are approved for that facility by the department:

1. Where an absorber is the final recovery device in the recovery system:

a. A scrubbing liquid temperature monitoring device having an accuracy of ±1% of the temperature being monitored expressed in degrees Celsius or ±0.5°C, whichever is greater and a specific gravity monitoring device having an accuracy of ±0.02 specific gravity units, each equipped with a continuous recorder; or

b. An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infrared, photoionization or thermal conductivity, each quipped with a continuous recorder.

2. Where a condenser is the final recovery device in the recovery system:

a. The condenser exit (product side) temperature monitoring device equipped with a continuous recorder and having an accuracy of ±1% of the temperature being monitored expressed in degrees Celsius or ±0.5°C, whichever is greater; or

b. An organic monitoring device used to monitor organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization or thermal conductivity, each equipped with a continuous recorder.

3. Where a carbon adsorber is the final recovery device unit in the recovery system:

a. An integrating steam flow monitoring device having an accuracy of ±10% and a carbon bed temperature monitoring device having an accuracy of ±1% of the temperature being monitored expressed in degrees Celsius or ±0.5°C, whichever is greater, both equipped with a continuous recorder; or

b. An organic monitoring device used to indicate the concentration level of organic compounds exiting the recovery device based on a detection principle such as infra-red, photoionization or thermal conductivity, each equipped with a continuous recorder.

(e) An owner or operator or an affected facility seeking to demonstrate compliance with the standards specified under sub. (3) with control devices other than incinerator, boiler, process heater or flare; or recovery device other than an absorber, condenser or carbon adsorber shall provide to the administrator information describing the operation of the control device or recovery device and the process parameters which would indicate proper operation and maintenance of the device. The administrator may request further information and will specify appropriate monitoring procedures or requirements.

(5) TEST METHODS AND PROCEDURES. (a) For the purpose of demonstrating compliance with sub. (3), all affected facilities shall be run at full operating conditions and flow rates during any performance test.

(b) The following methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, except as provided under s. NR 440.08(2), shall be used as reference methods to determine compliance with the emission limit or percent reduction efficiency specified under sub. (3)(a).

1. Method 1 or 1A, as appropriate, for selection of the sampling sites. The control device inlet sampling site for determination of vent stream molar composition or TOC, less methane and ethane, reduction efficiency shall be prior to the inlet of the control device and after the recovery system.

2. Method 2, 2A, 2C or 2D, as appropriate, for determination of the gas volumetric flow rates.

3. The emission rate correction factor, integrated sampling and analysis procedure of Method 3 shall be used to determine the oxygen concentration ($\%O_{2_d}$) for the purposes of determining compliance with the 20 ppmv limit. The sampling site shall be the same as that of the TOC samples and the samples shall be taken during the same time that the TOC samples are taken.

The TOC concentration corrected to 3% O_2 (C_c) shall be completed using the following equation:

$$C_c = C_{TOC} \frac{17.9}{20.9 - \%O_{2_d}}$$

where:

C_c is the concentration of TOC corrected to 3% O_2, dry basis, ppm by volume

C_{TOC} is the concentration of TOC (minus methane and ethane), dry basis, ppm by volume

$\%O_{2_d}$ is the concentration of O_2, dry basis, percent by volume

4. Method 18 to determine the concentration of TOC in the control device outlet and the concentration of TOC in the inlet when the reduction efficiency of the control device is to be determined.

a. The sampling time for each run shall be 1 hour in which either an integrated sample or 4 grab samples shall be taken. If grab sampling is used then the samples shall be taken at 15-minute intervals.

b. The emission reduction (R) of TOC (minus methane and ethane) shall be determined using the following equation:

$$R = \frac{E_i - E_o}{E_i} \times 100$$

where:

R is the emission reduction, percent by weight

E_i is the mass rate of TOC entering the control device, kg TOC/hr

E_o is the mass rate of TOC discharged to the atmosphere, kg TOC/hr

c. The mass rates of TOC (E_i, E_o) shall be computed using the following equations

$$E_i = K_2 \left(\sum_{j=1}^{n} C_{ij} M_{ij} \right) Q_i$$

$$E_o = K_2 \left(\sum_{j=1}^{n} C_{oj} M_{oj} \right) Q_o$$

where:

C_{ij} and C_{oj} are the concentration of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, dry basis, ppm by volume

M_{ij} and M_{oj} are the molecular weight of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, g/g-mole (lb/lb-mole)

Q_i and Q_o are the flow rate of gas stream at the inlet and outlet of the control device, respectively, dscm/min (dcsf/hr)

K_2 is a constant, 2.494×10^{-6} (1/ppm)(g-mole/scm)(kg/g)(min/hr), where standard temperature for (g-mole/scm) is 20°C

d. The TOC concentration (C_{TOC}) is the sum of the individual components and shall be computed for each run using the following equation:

$$C_{TOC} = \sum_{j=1}^{n} C_j$$

where:

C_{TOC} is the concentration of TOC (minus methane and ethane), dry basis, ppm by volume

C_j is the concentration of sample components "j", dry basis, ppm by volume

n is the number of components in the sample

5. When a boiler or process heater with a design heat input capacity of 44 MW (150 million Btu/hour) or greater is used to seek to comply with sub. (3)(a), the requirement for an initial performance test is waived, in accordance with s. NR 440.08(2). However, the department reserves the option to require testing at such other times as may be required.

(c) When a flare is used to seek to comply with sub. (3)(b), the flare shall comply with the requirements of s. NR 440.18.

(d) The following test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, except as provided under s. NR 440.08(2), shall be used for determining the net heating value of the gas combusted to determine compliance under sub. (3)(b) and for determining the process vent stream TRE index value to determine compliance under sub. (3)(c).

1. Method 1 or 1A, as appropriate, for selection of the sampling site. The sampling site for the vent stream flow rate and molar composition determination prescribed in subd. 2 and 3 shall be, except for the situations outlined in subpar. a, prior to the inlet of any control device, prior to any post-distillation dilution of the stream with air and prior to any post-distillation introduction of halogenated compounds into the process vent stream. No transverse site selection method is needed for vents smaller than 4 inches in diameter.

a. If any gas stream other than the distillation vent stream from the affected facility is normally conducted through the final recovery device.

b. The sampling site for vent stream flow rate and molar composition shall be prior to the final recovery device and prior to the point at which the nondistillation stream is introduced.

c. The efficiency of the final recovery device is determined by measuring the TOC concentration using Method 18 at the inlet to the final recovery device after the introduction of any nondistillation vent stream at the outlet of the final recovery device.

d. This efficiency is applied to the TOC concentration measured prior to the final recovery device and prior to the introduction of the nondistillation stream to determine the concentration of TOC in the distillation vent stream from the final recovery device. This concentration of TOC is then used to perform the calculations outlined in subd. 4 and 5.

2. The molar composition of the process vent stream shall be determined as follows:

a. Method 18 to measure the concentration of TOC including those containing halogens.

b. ASTM D1946-77, incorporation by reference in s. NR 440.17, to measure the concentration of carbon monoxide and hydrogen.

c. Method 4 to measure the content of water vapor.

3. The volumetric flow rate shall be determined using Method 2, 2A, 2C or 2D, as appropriate.

4. The net heating value of the vent stream shall be calculated using the following equation:

$$H_T = K_1 \left(\sum_{j=1}^{n} C_j H_j\right)$$

where:

H_T is the net heating value of the sample, Mj/scm, where the net enthalpy per mole of vent stream is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C, as in the definition of Q_s (vent stream flow rate)

K_1 is the constant, 1.740×10^{-7}

$$\frac{(1)}{\text{ppm}} \; \frac{(\text{g-mole})}{\text{scm}} \; \frac{(\text{MJ})}{\text{kcal}}$$

where standard temperature for

$$\frac{(\text{g-mole})}{\text{scm}}$$

is 20°C

C_j is the concentration on a wet basis of compound j in ppm, as measured for organics by Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-77, incorporation by references in s. NR 440.17, as indicated in par. (d)2.

H_j is the net heat of combustion of compound j, kcal/g-mole, based on combustion at 25°C and 760 mm Hg

The heats of combustion of vent stream components would be required to be determined using ASTM D2382-76, incorporation by reference as specified in s. NR 440.17, if published values are not available or cannot be calculated.

5. The emission rate of TOC in the vent stream shall be calculated using the following equation:

$$E_{TOC} = K_2\left(\sum_{j=1}^{n} C_j M_j\right) Q_s$$

where:

E_{TOC} is the emission rate of TOC in the sample, kg/hr

K_2 is the constant, 2.494×10^{-6}(1/ppm)(g-mole/scm)(kg/g)(min/hr), where standard temperature for (g-mole/scm) is 20°C

C_j is the concentration on a basis of compound j in ppm as measured by Method 18 as indicated in subd. 2

M_j is the molecular weight of sample j, g/g-mole

Q_s is the vent stream flow rate (scm/min) at a temperature of 20°C

6. The total process vent stream concentration (by volume) of compounds containing halogens (ppmv, by compound) shall be summed from the individual concentrations of compounds containing halogens which were measured by Method 18.

(e) For purpose of complying with sub. (3)(c), the owner or operator of a facility affected by this section shall calculate the TRE index value of the vent stream using the equation for incineration in subd. 1 for halogenated vent streams. The owner or operator of an affected facility with a nonhalogenated vent stream shall determine the TRE index value by calculating values using both the incinerator equation in subd. 1 and the flare equation in subd. 2 and selecting the lower of the 2 values.

1. The equation for calculating the TRE index value of a vent stream controlled by an incinerator is as follows:

$$TRE = \frac{1}{E_{TOC}}\left[a + b(Q_s)^{0.88} + c(Q_s) + d(Q_s)(H_T) + e(Q_s)^{0.88}(H_T)^{0.88} + f(Y_s)^{0.5}\right]$$

a. Where for a vent stream flow rate (scm/min) at a standard temperature of 20°C that is greater than or equal to 14.2 scm/min:

TRE is the TRE index value

Q_s is the vent stream flow rate (scm/min) at a standard temperature of 20°C

H_T is the vent stream net heating value (MJ/scm), where the net enthalpy per mole of vent stream is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C as in the definition of Q_s

$Y_s = Q_s$ for all vent stream categories listed in Table 1 except for Category E vent streams where $Y_s = (Q_s)(H_T)/3.6$

E_{TOC} is the hourly emissions of TOC reported in kg/hr

a,b,c,d,e and f are coefficients

The set of coefficients that apply to a vent stream shall be obtained from Table 1.

TABLE 1. DISTILLATION NSPS TRE COEFFICIENTS FOR VENT STREAMS CONTROLLED BY AN INCINERATOR

DESIGN CATEGORY A1. FOR HALOGENATED PROCESS VENT STREAMS, IF 0 ≤ NET HEATING VALUE (MJ/scm) ≤ 3.5:

Q_s = Vent Stream Flow rate (scm/min)	a	b	c	d	e	f
14.2 ≤ Q_s ≤ 18.8	19.18370	0.27580	0.75762	–0.13064	0	0.01025
18.8 < Q_s ≤ 699	20.00563	0.27580	0.30387	–0.13064	0	0.01025
699 < Q_s ≤ 1400	39.87022	0.29973	0.30387	–0.13064	0	0.01449
1400 < Q_s ≤ 2100	59.73481	0.31467	0.30387	–0.13064	0	0.01775
2100 < Q_s ≤ 2800	79.59941	0.32572	0.30387	–0.13064	0	0.02049
2800 < Q_s ≤ 3500	99.46400	0.33456	0.30387	–0.13064	0	0.02291

DESIGN CATEGORY A2. FOR HALOGENATED PROCESS VENT STREAMS, IF NET HEATING VALUE > 3.5 MJ/scm:

Q_s = Vent Stream Flow Rate (scm/min)	a	b	c	d	e	f
14.2 ≤ Q_s ≤ 18.8	18.84466	0.26742	–0.20044	0	0	0.01025
18.8 < Q_s ≤ 699	19.66658	0.26742	–0.25332	0	0	0.01025
699 < Q_s ≤ 1400	39.19213	0.29062	–0.25332	0	0	0.01449
1400 < Q_s ≤ 2100	58.71768	0.30511	–0.25332	0	0	0.01775
2800 < Q_s ≤ 3500	78.24323	0.31582	–0.25332	0	0	0.02049
	97.76879	0.32439	–0.25332	0	0	0.02291

DESIGN CATEGORY B. FOR NONHALOGENATED PROCESS VENT STREAMS, IF 0 ≤ NET HEATING VALUE (MJ/scm) ≤ 0.48:

Q_s = Vent Stream Flow rate (scm/min)	a	b	c	d	e	f
14.2 ≤ Q_s ≤ 1340	8.54245	0.10555	0.09030	–0.17109	0	0.01025
1340 < Q_s ≤ 2690	16.94386	0.11470	0.09030	–0.17109	0	0.01449
2690 < Q_s ≤ 4040	25.34528	0.12042	0.09030	–0.17109	0	0.01775

DESIGN CATEGORY C. FOR NONHALOGENATED PROCESS VENT STREAMS, IF 0.48 ≤ NET HEATING VALUE (MJ/scm) ≤ 1.9:

Q_s = Vent Stream Flow rate (scm/min)	a	b	c	d	e	f
14.2 ≤ Q_s ≤ 1340	9.25233	0.06105	0.31937	–0.16181	0	0.01025
1340 < Q_s ≤ 2690	18.36353	0.06635	0.31937	–0.16181	0	0.01449
2690 < Q_s ≤ 4040	27.47492	0.06965	0.31937	–0.16181	0	0.01775

DESIGN CATEGORY D. FOR NONHALOGENATED PROCESS VENT STREAMS, IF 1.9 ≤ NET HEATING VALUE (MJ/scm) ≤ 3.6:

Q_s = Vent Stream Flow rate (scm/min)	a	b	c	d	e	f
14.2 ≤ Q_s ≤ 1180	6.67868	0.06943	0.02582	0	0	0.01025
1180 < Q_s ≤ 2370	13.21633	0.07546	0.02582	0	0	0.01449
2370 < Q_s ≤ 3550	19.75398	0.07922	0.02582	0	0	0.01775

DESIGN CATEGORY E. FOR NONHALOGENATED PROCESS VENT STREAMS, IF NET HEATING VALUE > 3.6 MJ/scm:

Y_s = Vent Stream Flow rate (scm/min) = $(Q_s)(H_T)/3.6$	a	b	c	d	e	f
14.2 ≤ Y_s ≤ 1180	6.67868	0	0	–0.00707	0.02220	0.01025
1180 < Y_s ≤ 2370	13.21633	0	0	–0.00707	0.02412	0.01449
2370 < Y_s ≤ 3550	19.75398	0	0	–0.00707	0.02533	0.01775

b. Where for a vent stream flow rate (scm/min) at a standard temperature of 20°C that is less than 14.2 scm/min:

TRE is the TRE index value.

$Q_s = 14.2$ scm/min.

$H_T = (FLOW)(HVAL)/14.2$

where by the following inputs are used:

FLOW is the vent stream flow rate (scm/min), at a standard temperature of 20°C.

HVAL is the vent stream net heating value (MJ/scm), where the net enthalpy per mole of vent stream is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C as in definition of Q_s.

Y_s is 14.2 scm/min for all vent stream categories listed in Table 1 except for Category E vent streams, where Y_s is $(14.2)(H_T)/3.6$.

E_{TOC} is the hourly emissions of TOC reported in kg/hr.

a,b,c,d,e and f are coefficients.

The set of coefficients that apply to a vent stream shall be obtained from Table 1.

2. The equation for calculating the TRE index value of a vent stream controlled by a flare is as follows:

$$TRE = \frac{1}{E_{TOC}} [a(Q_s) + b(Q_s)^{0.8} + c(Q_s)(H_T) + d(E_{TOC}) + e]$$

where:

TRE is the TRE index value

E_{TOC} is the hourly emission rate of TOC reported in kg/hr

Q_s is the vent stream flow rate (scm/min) at a standard temperature of 20°C

H_T is the vent stream net heating value (MJ/scm) where the net enthalpy per mole of offgas is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C as in the definition of Q_s

a,b,c,d and e are coefficients

The set of coefficients that apply to a vent stream shall be obtained from Table 2.

Table 2. Distillation NSPS TRE Coefficients for Vent Streams Controlled by a Flare

	a	b	c	d	e
H_T <11.2 MJ/scm	2.25	0.288	−0.193	−0.0051	2.08
H_T >11.2 MJ/scm	0.309	0.0619	−0.0043	−0.0034	2.08

(f) Each owner or operator of an affected facility seeking to comply with sub. (1)(c)4 or (3)(c) shall recalculate the TRE index value for that affected facility whenever process changes are made. Examples of process changes include changes in production capacity, feedstock type or catalyst type or whenever there is replacement, removal or addition of recovery equipment. The TRE index value shall be recalculated based on test data or on best engineering estimates of the effects of the change to the recovery system.

1. Where the recalculated TRE index value is less than or equal to 1.0, the owner or operator shall notify the department within one week of the recalculation and shall conduct a performance test according to the methods and procedures required by sub. (5) in order to determine compliance with sub. (3)(a)1. Performance tests shall be conducted as soon as possible after the process change but no later than 180 days from the time of the process change.

2. Where the initial TRE index value is greater than 8.0 and the recalculated TRE index value is less than or equal to 8.0 but greater than 1.0, the owner or operator shall conduct a performance test in accordance with s. NR 440.08 and this subsection and shall comply with subs. (4) and (6) and this subsection. Performance tests shall be conducted as soon as possible after the process change but no later than 180 days from the time of the process change.

(g) Any owner or operator subject to the provisions of this section seeking to demonstrate compliance with sub. (1)(c)6 shall use Method 2, 2A, 2C or 2D as appropriate, for determination of volumetric flow rate.

(6) REPORTING AND RECORDKEEPING REQUIREMENTS. (a) Each owner or operator subject to sub. (3) shall notify the department of the specific provisions of sub. (3) with which the owner or operator has elected to comply. Notification shall be submitted with the notification of initial startup required by s. NR 440.07(1)(c). If an owner or operator elects at a later date to use an alternative provision of sub. (3) with which he or she will

comply, then the department shall be notified by the owner or operator within 90 days before implementing a change and, upon implementing the change, a performance test shall be performed as specified by sub. (5) within 180 days.

(b) Each owner or operator subject to the provisions of this section shall keep an up-to-date, readily accessible record of the following data measured during each performance test and also include the following data in the report of the initial performance test required under s. NR 440.08. Where a boiler or process heater with a design heat input capacity of 44 MW (150 million Btu/hour) or greater is used to comply with sub. (3)(a), a report containing performance test data need not be submitted but a report containing the information in subd. 2 a is required. The same data specified in this subsection shall be submitted in the reports of all subsequently required performance tests where either the emission control efficiency of a control device, outlet concentration of TOC or the TRE index value of a vent stream from a recovery system is determined.

1. Where an owner or operator subject to the provisions of this section seeks to demonstrate compliance with sub. (3)(a) through use of either a thermal or catalytic incinerator:

a. The average firebox temperature of the incinerator, or the average temperature upstream and downstream of the catalyst bed for a catalytic incinerator, measured at least every 15 minutes and averaged over the same time period of the performance testing and

b. The percent reduction of TOC determined as specified in sub. (5)(b) achieved by the incinerator or the concentration of TOC (ppmv, by compound) determined as specified in sub. (5)(b) at the outlet of the control device on a dry basis corrected to 3% oxygen.

2. Where an owner or operator subject to the provisions of this section seeks to demonstrate compliance with sub. (3)(a) through use of a boiler or process heater:

a. A description of the location at which the vent stream is introduced into the boiler or process heater, and

b. The average combustion temperature of the boiler or process heater with a design heat input capacity of less than 44 MW (150 million Btu/hr) measured at least every 15 minutes and averaged over the same time period of the performance testing.

3. Where an owner or operator subject to the provisions of this section seeks to demonstrate compliance with sub. (3)(b) through use of a smokeless

flare, flare design, that is, steam-assisted, air-assisted or nonassisted, all visible emission readings, heat content determinations, flow rate measurements and exit velocity determinations made during the performance test, continuous records of the flare pilot flame monitoring and records of all periods of operations during which the pilot flame is absent.

4. Where an owner or operator subject to the provisions of this section seeks to demonstrate compliance with sub. (3)(c):

a. Where an absorber is the final recovery device in the recovery system, the exit specific gravity, or alternative parameter which is a measure of the degree of absorbing liquid saturation, if approved by the department, and average exit temperature, of the adsorbing liquid measured at least every 15 minutes and averaged over the same time period of the performance testing, both measured while the vent stream is normally routed and constituted; or

b. Where a condenser is the final recovery device in the recovery system, the average exit (product side) temperature measured at least every 15 minutes and averaged over the same time period of the performance testing while the vent stream is routed and constituted normally; or

c. Where a carbon adsorber is the final recovery device in the recovery system, the total steam mass flow measured at least every 15 minutes and averaged over the same time period of the performance test (full carbon bed cycle), temperature of the carbon bed after regeneration, and within 15 minutes of completion of any cooling cycle, and duration of the carbon bed steaming cycle, all measured while the vent stream is routed and constituted normally; or

d. As an alternative to subpar. a, b or c, the concentration level or reading indicated by the organics monitoring device at the outlet of the absorber, condenser or carbon adsorber, measured at least every 15 minutes and averaged over the same time period of the performance testing while the vent stream is normally routed and constituted, or

e. All measurements and calculations performed to determine the TRE index value of the vent stream.

(c) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under sub. (4)(a) and (c) as well as up-to-date, readily accessible records of periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The department may at any time require a report of these data. Where a combustion device is used to comply with sub. (3)(a), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

1. For thermal incinerators, all 3-hour periods of operation during which the average combustion temperature was more than 28°C (50°F) below the average combustion temperature during the most recent performance test at which compliance with sub. (3)(a) was determined.

2. For catalytic incinerators, all 3-hour periods of operation during which the average temperature of the vent stream immediately before the catalyst bed is more than 28°C (50°F) below the average combustion temperature during the most recent performance test at which compliance with sub. (3)(a) was determined. The owner or operator also shall record all 3-hour periods of operation during which the average temperature difference across the catalyst bed is less than 80% of the average temperature difference of the device during the most recent performance test at which compliance with sub. (3)(a) was determined.

3. All 3-hour periods of operation during which the average combustion temperature was more than 28°C (50°F) below the average combustion temperature during the most recent performance test at which compliance with sub. (3)(a) was determined for boilers or process heaters with a design heat input capacity of less than 44 MW (150 million Btu/hr).

4. For boilers or process heaters, whenever there is a change in the location at which the vent stream is introduced into the flame zone as required under sub. (3)(a).

(d) Each owner or operator subject to the provisions of this section shall keep up to date, readily accessible continuous records of the flow indication specified under sub. (4)(a) 2, (b) 2 and (c) 1, as well as up-to-date, readily accessible records of all periods when the vent stream is diverted from the control device or has no flow rate.

(e) Each owner or operator subject to the provisions of this section who uses a boiler or process heater with a design heat input capacity of 44 MW (150 million BTU/hr) or greater to comply with sub. (3)(a) shall keep up-to-date, readily accessible records of all periods of operation of the boiler or process heater.

Note: Examples of such records could include records of steam use, fuel use or monitoring data collected pursuant to other state or federal regulatory requirements.

(f) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible records of the flare pilot flame monitoring specified under sub. (4)(b), as well as up-to-date, readily accessible records of all periods of operations in which the pilot flame is absent.

(g) Each owner or operator subject to the provisions of this section shall keep up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored under sub. (4)(d), as well as up-to-date, readily accessible records of all periods of operation during which the parameter boundaries established during the most recent performance test are exceeded. The department may at any time require a report of these data. Where an owner or operator seeks to comply with sub. (3)(c), periods of operation during which the parameter boundaries established during the most recent performance tests are exceeded are defined as follows:

1. Where an absorber is the final recovery device in a recovery system and where an organic compound monitoring device is not used:

a. All 3-hour periods of operating during which the average absorbing liquid temperature was more than 11°C (20°F) above the average absorbing liquid temperature during the most recent performance test; or

b. All 3-hour periods of operation during which the average absorbing liquid specific gravity was more than 0.1 unit above or more than 0.1 unit below, the average absorbing liquid specific gravity during the most recent performance test, unless monitoring of an alternative parameter, which is a measure of the degree of absorbing liquid saturation, is approved by the department, in which case the owner or operator will define appropriate parameter boundaries and periods of operation during which they are exceeded.

2. Where a condenser is the final recovery device in a system and where an organic compound monitoring device is not used, all 3-hour periods of operation during which the average exit (product side) condenser operating temperature was more than 6°C (11°F) above the average exit (product side) operating temperature during the most recent performance test.

3. Where a carbon adsorber is the final recovery device in a system and where an organic compound monitoring device is not used:

a. All carbon bed regeneration cycles during which the total mass stream flow was more than 10% below the total mass stream flow during the most recent performance test; or

b. All carbon bed regeneration cycles during which the temperature of the carbon bed after regeneration, and after completion of any cooling cycle, was more than 10% greater than the carbon bed temperature (in degrees Celsius) during the most recent performance.

4. Where an absorber, condenser or carbon adsorber is the final recovery device in the recovery system and where an organic compound monitoring device is used, all 3-hour periods of operation during which the average organic compound concentration level or reading of organic compounds in the exhaust gases is more than 20% greater than the exhaust gas organic compound concentration level or reading measured by the monitoring device during the most recent performance test.

(h) Each owner or operator of an affected facility subject to the provisions of this section and seeking to demonstrate compliance with sub. (3)(c) shall keep up-to-date, readily accessible records of:

1. Any changes in production capacity, feedstock type or catalyst type or any replacement, removal or addition of recovery equipment or a distillation unit;

2. Any recalculation of the TRE index value performed pursuant to sub. (5)(f); and

3. The results of any performance test performed pursuant to the methods and procedures required by sub. (5)(d).

(i) Each owner or operator of an affected facility that seeks to comply with the requirements of this section by complying with the flow rate cutoff in sub. (1)(c)6 shall keep up-to-date, readily accessible records to indicate that the vent stream flow rate is less than 0.008 m^3/min and of any change in equipment or process operation that increases the operating vent stream flow rate, including a measurement of the new vent stream flow rate.

(j) Each owner or operator of an affected facility that seeks to comply with the requirements of this section by complying with the design production capacity provision in sub. (1)(c)5 shall keep up-to-date, readily accessible records of any change in equipment or process operation that increases the design production capacity of the process unit in which the affected facility is located.

(k) Each owner and operator subject to the provisions of this section is exempt from the quarterly reporting requirements contained in s. NR 440.07(3).

(l) Each owner or operator that seeks to comply with the requirements of this section by complying with the requirements of sub. (1)(c)4, 5 or 6 or (3) shall submit to the department semiannual reports of the following recorded information. The initial report shall be submitted within 6 months after the initial startup date.

1. Exceedances of monitored parameters recorded under pars. (c) and (g).

2. All periods recorded under par. (d) when the vent stream is diverted from the control device or has no flow rate.

3. All periods recorded under par. (e) when the boiler or process heater was not operating.

4. All periods recorded under par. (f) in which the pilot flame of the flare was absent.

5. Any change in equipment or process operation that increases the operating vent stream flow rate above the low flow exemption level in sub. (1)(c)6, including a measurement of the new vent stream flow rate, as recorded under par. (i). These shall be reported as soon as possible after the change and no later than 180 days after the change. A performance test shall be completed with the same time period to verify the recalculated flow value and to obtain the vent stream characteristics of heating value and E_{TOC}. The performance test is subject to the requirements of s. NR 440.08. Unless the facility qualifies for an exemption under the low capacity exemption status in sub. (1)(c)5, the facility shall begin compliance with the requirements set forth in sub. (3).

6. Any change in equipment or process operation, as recorded under par. (j), that increases the design production capacity above the low capacity exemption level in sub. (1)(c)5 and the new capacity resulting from the change for the distillation process unit containing the affected facility. These shall be reported as soon as possible after the change and no later than 180 days after the change. A performance test shall be completed within the same time period to obtain the vent stream flow rate, heating value, E_{TOC}. The performance test is subject to the requirements of s. NR 440.08. Unless the facility qualifies for an exemption under the low flow exemption in sub. (1)(c)6, the facility shall begin compliance with the requirements in sub. (3).

7. Any recalculation of the TRE index value, as recorded under par. (h).

(n) Each owner or operator that seeks to demonstrate compliance with sub. (1)(c)5 shall submit to the department an initial report detailing the design production capacity of the process unit.

(o) Each owner or operator that seeks to demonstrate compliance with sub. (1)(c)6 shall submit to the department an initial report including a flow rate measurement using the test methods specified in sub. (5).

(p) The department will specify appropriate reporting and recordkeeping requirements where the owner or operator of an affected facility complies with the standards specified under sub. (3) other than as provided under sub. (4)(a) to (d).

(7) RECONSTRUCTION. (a) For purposes of this section, "fixed capital cost of the new components", as used in s. NR 440.15, includes the fixed capital cost of all depreciable components which are or will be replaced pursuant to all continuous programs of component replacement which are commended with any 2-year period following December 30, 1983. For purposes of this paragraph, "commenced" means that an owner or operator has undertaken a continuous program of component replacement or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of component replacement.

(8) CHEMICALS AFFECTED BY THIS SECTION.

Chemical name	CAS No.*
Acetaldehyde	75-07-0
Acetaldol	107-89-1
Acetic acid	64-19-7
Acetic anhydride	108-24-7
Acetone	67-64-1
Acetone cyanohydrin	75-86-5
Acetylene	74-86-2
Acrylic acid	79-10-7
Acrylonitrile	107-13-1
Adipic acid	124-04-9
Adiponitrile	111-69-3
Alcohols, C-11 or lower, mixtures	....
Alcohols, C-12 or higher, mixtures	....
Allyl chloride	107-05-1
Amylene	513-35-9
Amylenes, mixed	....
Aniline	62-53-3
Benzene	71-43-2
Benzenesulfonic acid	98-11-3
Benzenesulfonic acid C_{10-16}-alkyl derivatives, sodium salts	68081-81-2
Benzoic acid, tech	65-85-0
Benzyl chloride	100-44-7
Biphenyl	92-52-4
Bisphenol A	80-05-7
Brometone	76-08-4
1,3-Butadiene	106-99-0
Butadiene and butene fractions	....
n-Butane	106-97-8
1,4-Butanediol	110-63-4
Butanes, mixed	....
1-Butene	106-98-9
2-Butene	25167-67-3
Butenes, mixed	....
n-Butyl acetate	123-86-4
Butyl acrylate	141-32-2
n-Butyl alcohol	71-36-3
sec-Butyl alcohol	78-92-2
tert-Butyl alcohol	75-65-0
Butylbenzyl phthalate	85-68-7
Butylene glycol	107-88-0
tert-Butyl hydroperoxide	75-91-2
2-Butyne-1,4-diol	110-65-6
Butyraldehyde	123-72-8
Butyric anhydride	106-31-0
Caprolactam	105-60-2
Carbon disulfide	75-15-0
Carbon tetrabromide	558-13-4
Carbon tetrachloride	56-23-5
Chlorobenzene	108-90-7

Chemical name	CAS No.*
2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine	1912-24-9
Chloroform	67-66-3
p-Chloronitrobenzene	100-00-5
Chloroprene	126-99-8
Citric acid	77-92-9
Crotonaldehyde	4170-30-0
Crotonic acid	3724-65-0
Cumene	98-82-8
Cumene hydroperoxide	80-15-9
Cyanuric chloride	108-77-0
Cyclohexane	110-82-7
Cyclohexane, oxidized	68512-15-2
Cyclohexanol	108-93-0
Cyclohexanone	108-94-1
Cyclohexanone oxime	100-64-1
Cyclohexene	110-83-8
1,3-Cyclopentadiene	542-92-7
Cyclopropane	75-19-4
Diacetone alcohol	123-42-2
Dibutanized aromatic concentrate	....
1,4-Dichlorobutene	110-57-8
3,4-Dichlor-1-butene	64037-54-3
Dichlorodifluoromethane	75-71-8
Dichlorodimethylsilane	75-78-5
Dichlorofluoromethane	75-43-4
1,3-Dichlorohydrin	96-23-1
Diethanolamine	111-42-2
Diethylbenzene	25340-17-4
Diethylene glycol	111-46-6
Di-n-heptyl-n-nonyl undecyl phthalate	85-68-7
Di-isodecyl phthalate	26761-40-0
Diisononyl phthalate	28553-12-0
Dimethylamine	124-40-3
Demithyl terephthalate	120-61-6
2,4-Dinitrotoluene	121-14-2
2,6-Dinitrotoluene	606-20-2
Dioctyl phthalate	117-81-7
Dodecene	25378-22-7
Dodecylbenzene, non linear	....
Dodecylbenzenesulfonic acid	27176-87-0
Dodecylbenzenesulfonic acid, sodium salt	25155-30-0
Epichlorohydrin	106-89-8
Ethanol	64-17-5
Ethanolamine	141-43-5
Ethyl acetate	141-78-6
Ethyl acrylate	140-88-5
Ethylbenzene	100-41-4

Chemical name	CAS No.*
Ethyl chloride	75-00-3
Ethyl cyanide	107-12-0
Ethylene	74-85-1
Ethylene dibromide	106-93-4
Ethylene dichloride	107-06-2
Ethylene glycol	107-21-1
Ethylene glycol monobutyl	111-76-2
Ethylene glycol monoethyl ether	110-80-5
Ethylene glycol monoethyl ether acetate	111-15-9
Ethylene glycol monomethyl ether	108-86-4
Ethylene oxide	75-21-8
2-Ethylhexanal	26266-68-2
2-Ethylhexyl alcohol	104-76-7
(2-Ethylhexyl) amine	104-75-6
Ethylmethylbenzene	25550-14-5
6-Ethyl-1,2,3,4-tetrahydro-9,10-anthracenedione	15547-17-8
Formaldehyde	50-00-0
Glycerol	56-81-5
n-Heptane	142-82-5
Heptenes, mixed	....
Hexadecyl chloride	....
Hexamethylene diamine	124-09-4
Hexamethylene diamine adipate	3323-53-3
Hexamethylenetetramine	100-97-0
Hexane	110-54-3
2-Hexenedinitrile	13042-02-9
3-Hexenedinitrile	1119-85-3
Hydrogen cyanide	74-90-8
Isobutane	75-28-5
Isobutanol	78-83-1
Isobutylene	115-11-7
Isobytyraldehyde	78-84-2
Isodecyl alcohol	25339-17-7
Isooctyl alcohol	26952-21-6
Isopentane	78-78-4
Isophthalic acid	121-91-5
Isoprene	78-79-5
Isopropanol	67-63-0
Ketene	463-51-4
Linear alcohols, ethoxylated, mixed	....
Linear alcohols, ethoxylated and sulfated, sodium salt, mixed	....
Linear alcohols, sulfated, sodium salt, mixed	....
Linear alkylbenzene	123-01-3
Magnesium acetate	142-72-3
Maleic anhydride	108-31-6
Melamine	108-78-1
Mesityl oxide	141-79-7
Methacrylonitrile	126-98-7

Chemical name	CAS No.*
Methanol	67-56-1
Methylamine	74-89-5
ar-Methylbenzenediamine	25376-45-8
Methyl chloride	74-87-3
Methylene chloride	75-09-2
Methyl ethyl ketone	78-93-3
Methyl iodide	74-88-4
Methyl isobutyl ketone	108-10-1
Methyl methacrylate	80-62-6
2-Methylpentane	107-83-5
1-Methyl-2-pyrrolidone	872-50-4
Methyl tert-butyl ether	....
Naphthalene	91-20-3
Nitrobenzene	98-95-3
1-Nonene	27215-95-8
Nonyl alcohol	143-08-08
Nonylphenol	25154-52-3
Nonylphenol, ethoxylated	9016-45-9
Octene	25377-83-7
Oil-soluble petroleum sulfonate, calcium salt	....
Oil-soluble petroleum sulfonate, sodium salt	....
Pentaerythritol	115-77-5
n-Pentane	109-66-0
3-Pentenenitrile	4635-87-4
Pentenes, mixed	109-67-1
Perchloroethylene	127-18-4
Phenol	108-95-2
1-Phenylethyl hydroperoxide	3071-32-7
Phenylpropane	103-65-1
Phosgene	75-44-5
Phthalic anhydride	85-44-9
Propane	74-98-6
Propionaldehyde	123-38-6
Propionic acid	79-09-4
Propyl alcohol	71-23-8
Propylene	115-07-1
Propylene chlorohydrin	78-89-7
Propylene glycol	57-55-6
Propylene oxide	75-56-9
Propyl alcohol	71-23-8
Propylene	115-07-1
Sodium cyanide	143-33-9
Sorbitol	50-70-4
Styrene	100-42-5
Terephthalic acid	100-21-0
1,1,2,2-Tetrachloroethane	79-34-5

Chemical name	CAS No.*
Tetraethyl lead	78-00-2
Tetrahydrofuran	109-99-9
Tetra (methyl-ethyl) lead	....
Tetramethyl lead	75-74-1
Toluene	108-88-3
Toluene-2,4-diamine	95-80-7
Toluene-2,4 (and 2,6)-diisocyanate (80/20 mixture)	26471-62-5
Tribromomethane	75-25-2
1,1,1-Trichloroethane	71-55-6
1,1,2-Trichloroethane	79-00-5
Trichloroethylene	79-01-6
Trichlorfluoromethane	75-89-4
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1
Triethanolamine	102-71-6
Triethylene glycol	112-27-67
Vinyl acetate	108-05-4
Vinyl chloride	75-01-4
Vinylidene chloride	75-35-4
m-Xylene	108-38-3
o-Xylene	95-47-6
p-Xylene	106-42-3
Xylenes, mixed	1330-20-7
m-Xylenol	576-26-1

*CAS numbers refer to the Chemical Abstracts Registry numbers assigned to specific chemicals, isomers or mixtures of chemicals. Some isomers or mixtures that are covered by the standards do not have CAS numbers assigned to them. The standards apply to all of the chemicals listed, whether CAS numbers have been assigned or not.

SECTION 178. NR 440.688(3)(d) and (e)(intro.) are amended to read:

NR 440.688(3)(d) Truck dumping of nonmetallic minerals into any screening operation, feed hopper or crusher is exempt from the requirements of this ~~section~~ subsection.

(e)(intro.) If any transfer point on a conveyor belt or any other affected facility is enclosed in a building, then each enclosed affected facility shall comply with the emission limits in pars. (a), (b) and (c), or the building enclosing the affected facility or facilities shall comply with the following emission limits:

SECTION 179. NR 440.688(6) is repealed and recreated to read:

NR 440.688(6) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17 or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2). Acceptable alternative methods and procedures are given in par. (e).

(b) The owner or operator shall determine compliance with the particulate matter standards in sub. (3)(a) as follows:

1. Method 5 or Method 17 shall be used to determine the particulate matter concentration. The sample volume shall be at least 1.70 dscm (60 dscf). For Method 5, if the gas stream being sampled is at ambient temperature, the sampling probe and filter may be operated without heaters. If the gas stream is above ambient temperature, the sampling probe and filter may be operated at a temperature high enough, but no higher than 121°C (250°F), to prevent water condensation on the filter.

2. Method 9 and the procedures in s. NR 440.11 shall be used to determine opacity.

(c) In determining compliance with the particulate matter standards in sub. (3)(b) and (c), the owner or operator shall use Method 9 and the procedures in s. NR 440.11, with the following additions:

1. The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet).

2. The observer shall, when possible, select a position that minimizes interference from other fugitive emission sources, for example, road dust. The required observer position relative to the sun (Method 9, Section 2.1) shall be followed.

3. For affected facilities using wet dust suppression for particulate matter control, a visible mist is sometimes generated by the spray. The water mist may not be confused with particulate matter emissions and is not to be considered a visible emission. When a water mist of this nature is present, the observation of emission is to be made at a point in the plume where the mist is no longer visible.

(d) In determining compliance with sub. (3)(e), the owner or operator shall use Method 22 to determine fugitive emissions. The performance test shall be conducted while all affected facilities inside the building are operating. The performance test for each building shall be at least 75 minutes in duration, with each side of the building and the roof being observed for at least 15 minutes.

(e) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this subsection:

1. For the method and procedure of par. (c), if emissions from 2 or more facilities continuously interfere so that the opacity of fugitive emissions from an individual affected facility cannot be read, either of the following procedures may be used:

a. Use for the combined emission stream the highest fugitive opacity standard applicable to any of the individual affected facilities contributing to the emission stream.

b. Separate the emissions so that the opacity of emissions from each affected facility can be read.

(f) To comply with sub. (7)(d), the owner or operator shall record the measurements as required in sub. (7)(c) using the monitoring devices in sub. (5)(a) and (b) during each particulate matter run and shall determine the averages.

SECTION 180. NR 440.688(7)(d) is amended to read:

NR 440.688(7)(d) After the initial performance test of a wet scrubber, the owner or operator shall submit semiannual reports to the department of occurrences when the measurements of the scrubber pressure loss (or gain) and liquid flow rate differ by more than ±30% for ~~those measurements recorded~~ the average determined during the most recent performance test.

SECTION 181. NR 440.69(4)(b) is amended to read:

NR 440.69(4)(b) An owner or operator subject to the provisions of this section who uses a wet electrostatic precipitator control device to comply with the mass emission standard shall install, calibrate, maintain and operate monitoring devices that measure the primary and secondary current (amperes) and voltage in each electrical field and the inlet water flow rate. In addition the owner or operator shall determine the total residue (total solids) content of the water entering the control device once per day using Method ~~209A~~ 2540 B., "Total ~~Residue~~ Solids Dried at 103-105°C," in Standard Methods for the Examination of Water and Wastewater, ~~15th Edition, 1980,~~ 17th edition, 1989, incorporated by reference in s. NR 440.17. Total ~~residue~~ solids shall be reported as percent by weight. All monitoring devices required under this paragraph are to be certified by their manufacturers to be accurate within ±5% over their operating range.

SECTION 182. NR 440.69(6) is repealed and recreated to read:

NR 440.69(6) TEST METHODS AND PROCEDURES. (a) In conducting the performance tests required in s. NR 440.08, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17 or other methods and procedures as specified in this subsection, except as provided in s. NR 440.08(2).

(b) The owner or operator shall conduct performance tests while the product with the highest loss on ignition (LOI) expected to be produced by the affected facility is being manufactured.

(c) The owner or operator shall determine compliance with the particulate matter standard in sub. (3) as follows:

1. The emission rate (E) of particulate matter shall be computed for each run using the following equation:

$$E = (C_t\ Q_{sd})/(P_{avg}\ K)$$

where:

E is the emission rate of particulate matter, kg/Mg (lb/ton)

C_t is the concentration of particulate matter, g/dscm (g/dscf)

Q_{sd} is the volumetric flow rate of effluent gas, dscm/hr (dscf/hr)

P_{avg} is the average glass pull rate, Mg/hr (ton/hr)

K is the conversion factor, 1000 g/kg (453.6 g/lb)

2. Method 5E shall be used to determine the particulate matter concentration (C_t) and the volumetric flow rate (Q_{sd}) of the effluent gas. The sampling time and sample volume shall be at least 120 minutes and 2.55 dscm (90 dscf).

3. The average glass pull rate (P_{avg}) for the manufacturing line shall be the arithmetic average of 3 glass pull rate (P_i) determinations taken at intervals of at least 30 minutes during each run.

The individual glass pull rates (P_i) shall be computed using the following equation:

$$P_i = K' L_s\ W_m\ [1.0 - (LOI/100)]$$

where:

P_i is the glass pull rate at interval "i", Mg/hr (ton/hr)

L_s is the line speed, m/min (Ft/min)

W_m is the trimmed mat width, m (ft.)

M is the mat gram weight, g/m^2 (lb/ft^2)

LOI is the loss on ignition, weight percent

K′ is the conversion factor, 6×10^{-5} (min-Mg)/(hr-g) [3×10^{-2} (min-ton)/(hr-lb)]

a. ASTM Standard Test Method D2584-68 (reapproved 1979), incorporated by reference in s. NR 440.17, shall be used to determine the LOI for each run.

b. Line speed (L_s) trimmed mat width (W_m) and mat gram weight (M) shall be determined for each run from the process information or from direct measurements.

(d) To comply with sub. (5)(d), the owner or operator shall record measurements as required in sub. (5)(a) and (b) using the monitoring devices in sub. (4)(a) and (b) during the particulate matter runs.

SECTION 183. NR 440.70 is created to read:

<u>NR 440.70 VOC EMISSIONS FROM PETROLEUM REFINERY WASTEWATER SYSTEMS</u>. (1) APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY. (a)1. The provisions of this section apply to affected facilities located in petroleum refineries for which construction, modification or reconstruction is commenced after May 4, 1987.

2. An individual drain system is a separate affected facility.

3. An oil-water separator is a separate affected facility.

4. An aggregate facility is a separate affected facility.

(b) Notwithstanding the provisions of s. NR 440.14(5)(b), the construction or installation of a new individual drain system shall constitute a modification to an affected facility described in par. (a)4. For purposes of this subdivision, a new individual drain system shall be limited to all process drains and the first common junction box.

(2) DEFINITIONS. As used in this section, all terms not defined herein shall have the meaning given them in s. NR 440.02 and the following terms shall have the specific meanings given them.

(a) "Active service" means that a drain is receiving refinery wastewater from a process unit that will continuously maintain a water seal.

(b) "Aggregate facility" means an individual drain system together with ancillary downstream sewer lines and oil-water separators, down to and including the secondary oil-water separator, as applicable.

(c) "Catch basin" means an open basin which serves as a single collection point for stormwater runoff received directly from refinery surfaces and for refinery wastewater from process drains.

(d) "Closed vent system" means a system that is not open to the atmosphere and is composed of piping, connections and, if necessary, flow inducing devices that transport gas or vapor from an emission source to a control device.

(e) "Completely closed drain system" means an individual drain system that is not open to the atmosphere and is equipped and operated with a closed vent system and control device complying with the requirements of sub. (7).

(f) "Control device" means an enclosed combustion device, vapor recovery system or flare.

(g) "Fixed roof" means a cover that is mounted to a tank or chamber in a stationary manner and which does not move with fluctuations in wastewater levels.

(h) "Floating roof" means a pontoon-type or double-deck type cover that rests on the liquid surface.

(i) "Gas-tight" means operated with no detectable emissions.

(j) "Individual drain system" means all process drains connected to the first common downstream junction box. The term includes all such drains and common junction box, together with their associated sewer lines and other junction boxes, down to the receiving oil-water separator.

(k) "Junction box" means a manhole or access point to a wastewater sewer system line.

(l) "No detectable emissions" means less than 500 ppm above background levels, as measured by a detection instrument in accordance with Method 21 in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17.

(m) "Non-contact cooling water system" means a once-through drain, collection and treatment system designed and operated for collecting cooling water which does not come into contact with hydrocarbons or oily wastewaters and which is not recirculated through a cooling tower.

(n) "Oil-water separator" means wastewater treatment equipment used to separate oil from water consisting of a separation tank, which also includes the forebay and other separator basins, skimmers, weirs, grit chambers and sludge hoppers. Slop oil facilities, including tanks, are included in this term along with storage vessels and auxiliary equipment located between individual drain systems and the oil-water separator. This term does not include storage vessels or auxiliary equipment which do not come in contact with or store oily wastewater.

(o) "Oily wastewater" means wastewater generated during the refinery process which contains oil, emulsified oil or other hydrocarbons. Oily wastewater originates from a variety of refinery processes including cooling water, condensed stripping steam, tank draw-off and contact process water.

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

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

(r) "Sewer line" means a lateral, trunk line, branch line, ditch, channel or other conduit used to convey refinery wastewater to downstream components of a refinery wastewater treatment system. This term does not include buried, below-grade sewer lines.

(s) "Slop oil" means the floating oil and solids that accumulate on the surface of an oil-water separator.

(t) "Storage vessel" means any tank, reservoir or container used for the storage of petroleum liquids, including oil wastewater.

(u) "Stormwater sewer system" means a drain and collection system designed and operated for the sole purpose of collecting stormwater and which is segregated from the process wastewater collection system.

(v) "Wastewater system" means any component, piece of equipment or installation that receives, treats or processes oily wastewater from petroleum refinery process units.

(w) "Water seal controls" means a seal pot, p-leg, trap or other type of trap filled with water that has a design capability to create a water barrier between the sewer and atmosphere.

(3) STANDARDS: GENERAL. (a) Each owner or operator subject to the provisions of this section shall comply with the requirements of this

subsection, with subs. (4) to (7), (10) and (11), except during periods of startup, shutdown or malfunction.

(b) Compliance with this subsection, subs. (4) to (7), (10) and (11) shall be determined by review of records and reports, review of performance test results and inspection using the methods and procedures specified in sub. (14).

(c) Permission to use alternative means of emission limitation to meet the requirements of subs. (4) to (6) may be granted if the administrator's approval is obtained under 40 CFR s. 60.694.

Note: See Note in sub. (11).

(d) Stormwater sewer systems are not subject to the requirements of this section.

(e) Ancillary equipment, which is physically separate from the wastewater system and does not come in contact with or store oily wastewater, is not subject to the requirements of this section.

(f) Non-contact cooling water systems are not subject to the requirements of this section.

(g) An owner or operator shall demonstrate compliance with the exclusions in pars. (d) to (f), as provided in sub. (15)(l), (m) and (n).

(4) STANDARDS: INDIVIDUAL DRAIN SYSTEMS. (a) Each drain shall be equipped with water seal controls.

(b) Each drain in active service shall be checked by visual or physical inspection initially and monthly thereafter for indications of low water levels or other conditions that would reduce the effectiveness of the water seal controls.

(c) Except as provided in par. (d), each drain out of active service shall be checked by visual or physical inspection initially and weekly thereafter for indications of low water levels or other problems that could result in VOC emissions.

(d) As an alternative to the requirements in par. (c), if an owner or operator elects to install a tightly sealed cap or plug over a drain that is out of service, inspections shall be conducted initially and semiannually to ensure caps or plugs are in place and properly installed.

(e) Whenever low water levels or missing or improperly installed caps or plugs are identified, water shall be added or first efforts at repair shall be made as soon as practicable, but not later than 24 hours after detection, except as provided in sub. (8).

(f) Junction boxes shall be equipped with a cover and may have an open vent pipe. The vent pipe shall be at least 90 cm (3 ft.) in length and may not exceed 10.2 cm (4 in) in diameter.

(g) Junction box covers shall have a tight seal around the edge and shall be kept in place at all times, except during inspection and maintenance.

(h) Junction boxes shall be visually inspected initially and semiannually thereafter to ensure that the cover is in place and to ensure that the cover has a tight seal around the edge.

(i) If a broken seal or gap is identified, the first effort at repair shall be made as soon as practicable, but not later than 15 calendar days after the broken seal or gap is identified, except as provided in sub. (8).

(j) Sewer lines may not be open to the atmosphere and shall be covered or enclosed in a manner so as to have no visual gaps or cracks in joints, seals or other emission interfaces.

(k) The portion of each unburied sewer line shall be visually inspected initially and semiannually thereafter for indication of cracks, gaps or other problems that could result in VOC emissions.

(l) Whenever cracks, gaps or other problems are detected, repairs shall be made as soon as practicable, but not later than 15 calendar days after identification, except as provided in sub. (8).

(m) Except as provided in par. (n), each modified or reconstructed individual drain system that has a catch basin in the existing configuration prior to May 4, 1987 shall be exempt from the provisions of this subsection.

(n) Refinery wastewater routed through new process drains and a new first common downstream junction box, either as part of a new individual drain system or an existing individual drain system, may not be routed through a downstream catch basin.

(5) STANDARDS: OIL-WATER SEPARATORS. (a) Each oil-water separator tank, slop oil tank, storage vessel or other auxiliary equipment subject to the requirements of this section shall be equipped and operated with a fixed roof, which meets the following specifications, except as provided in par. (d) or in sub. (11).

1. The fixed roof shall be installed to completely cover the separator tank, slop oil tank, storage vessel or other auxiliary equipment with no separation between the roof and the wall.

2. The vapor space under a fixed roof may not be purged unless the vapor is directed to a control device.

3. If the roof has access doors or openings, such doors or openings shall be gasketed, latched and kept closed at all times during operation of the separator system, except during inspection and maintenance.

4. Roof seals, access doors and other openings shall be checked by visual inspection initially and semiannually thereafter to ensure that no cracks or gaps occur between the roof and wall and that access doors and other openings are closed and gasketed properly.

5. When a broken seal or gasket or other problem is identified, first efforts at repair shall be made as soon as practicable, but not later than 15 calendar days after it is identified, except as provided in sub. (8).

(b) Each oil-water separator tank or auxiliary equipment with a design capacity to treat more than 16 liters per second (250 gpm) of refinery wastewater shall, in addition to the requirements in par. (a), be equipped and operated with a closed vent system and control device, which meet the requirements of sub. (7), except as provided in par. (c) or in sub. (11).

(c) Each modified or reconstructed oil-water separator tank with a maximum design capacity to treat less than 38 liters per second (600 gpm) of refinery wastewater which was equipped and operated with a fixed roof covering the entire separator tank or a portion of the separator tank prior to May 4, 1987 shall be exempt from the requirements of par. (b), but shall meet the requirements of par. (a) or may elect to comply with par. (c)1.

1. The owner or operator may elect to comply with the requirements of par. (a) for the existing fixed roof covering a portion of the separator tank and comply with the requirements for floating roofs in sub. (11) for the remainder of the separator tank.

(d) Storage vessels, including slop oil tanks and other auxiliary tanks that are subject to the requirements of s. NR 440.27, 440.28 or 440.285, are not subject to the requirements of this subsection.

(e) Slop oil from an oil-water separator tank and oil wastewaters from slop oil handling equipment shall be collected, stored, transported, recycled, reused or disposed of in an enclosed system. Once slop oil is returned to the process unit or is disposed of, it is no longer within the scope of this section. Equipment used in handling slop oil shall be equipped with a fixed roof meeting the requirements of par. (a).

(f) Each oil-water separator tank, slop oil tank, storage vessel or other auxiliary equipment that is required to comply with par. (a) and not par. (b), may be equipped with a pressure control valve as necessary for proper system operation. The pressure control valve shall be set at the maximum pressure necessary for proper system operation, but such that the valve will not vent continuously.

(6) STANDARDS: AGGREGATE FACILITY. A new, modified or reconstructed aggregate facility shall comply with the requirements of subs. (4) and (5).

(7) STANDARDS: CLOSED VENT SYSTEM AND CONTROL DEVICES. (a) Enclosed combustion devices shall be designed and operated to reduce the VOC emissions vented to them with an efficiency of 95% or greater or to provide a minimum residence time of 0.75 seconds at a minimum temperature of 816°C (1,500°F).

(b) Vapor recovery systems, for example, condensers and absorbers, shall be designed and operated to recover the VOC emissions vented to them with an efficiency of 95% or greater.

(c) Flares used to comply with this section shall comply with the requirements of s. NR 440.18.

(d) Closed vent systems and control devices used to comply with provisions of this section shall be operated at all times when emissions may be vented to them.

(e) Closed vent system shall be designed and operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as determined during the initial and semiannual inspections by the methods specified in sub. (14).

(f) Closed vent systems shall be purged to direct vapor to the control device.

(g) A flow indicator shall be installed on a vent stream to control a control device to ensure that the vapors are being routed to the device.

(h) All gauging and sampling devices shall be gas-tight except when gauging or sampling is taking place.

(i) When emissions from a closed system are detected, first efforts at repair to eliminate the emissions shall be made as soon as practicable, but not later than 30 calendar days from the date the emissions are detected, except as provided in sub. (8).

(8) STANDARDS: DELAY OF REPAIR. (a) Delay of repair of facilities that are subject to the provisions of this section will be allowed if the repair is technically impossible without a complete or partial refinery or process unit shutdown.

(b) Repair of such equipment shall occur before the end of the next refinery or process unit shutdown.

(9) STANDARDS: DELAY OF COMPLIANCE. (a) Delay of compliance of modified individual drain systems with ancillary downstream treatment components will be allowed if compliance with the provisions of this section cannot be achieved without a refinery or process unit shutdown.

(b) Installation of equipment necessary to comply with the provisions of this section shall occur no later than the next scheduled refinery or process unit shutdown.

(10) ALTERNATIVE STANDARDS FOR INDIVIDUAL DRAIN SYSTEMS. (a) An owner or operator may elect to construct and operate a completely closed drain system.

(b) Each completely closed drain system shall be equipped and operated with a closed vent system and control device complying with the requirements of sub. (7).

(c) An owner or operator shall notify the department in the report required in s. NR 440.07 that the owner or operator has elected to construct and operate a completely closed drain system.

(d) If the owner or operator elects to comply with the provisions of this subsection, then the owner or operator does not need to comply with the provisions of sub. (4) or (11) Note.

(e) Sewer lines may not be open to the atmosphere and shall be covered or enclosed in a manner so as to have no visual gaps or cracks in joints, seals or other emission interfaces.

(f) The portion of each unburied sewer line shall be visually inspected initially and semiannually thereafter for indication of cracks, gaps or other problems that could result in VOC emissions.

(g) Whenever cracks, gaps or other problems are detected, repairs shall be made as soon as practicable, but not later than 15 calendar days after identification, except as provided in sub. (8).

(11) ALTERNATIVE STANDARDS FOR OIL-WATER SEPARATORS. (a) An owner or operator may elect to construct and operate a floating roof on an oil-water separator tank, slop oil tank, storage vessel or other auxiliary equipment subject to the requirements of this section which meets the following specifications.

1. Each floating roof shall be equipped with a closure device between the wall of the separator and the roof edge. The closure device is to consist of a primary seal and a secondary seal.

2. The primary seal shall be a liquid-mounted seal.

3. A liquid-mounted seal means a foam or liquid-filled seal mounted in contact with the liquid between the wall of the separator and the floating roof.

4. The gap width between the primary seal and the separator wall may not exceed 3.8 cm (1.5 in) at any point.

5. The total gap area between the primary seal and the separator wall may not exceed 67 cm^2/m (3.2 in^2/ft) of separator wall perimeter.

6. The secondary seal shall be above the primarily seal and cover the annular space between the floating roof and the wall of the separator.

7. The gap width between the secondary seal and the separator wall may not exceed 1.3 cm (0.5 in) at any point.

8. The total gap area between the secondary seal and the separator wall may not exceed 6.7 cm^2/m (0.32 in^2/ft) of separator wall perimeter.

(b) The maximum gap width and total gap area shall be determined by the methods and procedures specified in sub. (14)(d).

1. Measurement of primary seal gaps shall be performed within 60 calendar days after initial installation of the floating roof and introduction of refinery wastewater and once every 5 years thereafter.

2. Measurement of secondary seal gaps shall be performed within 60 calendar days of initial introduction of refinery wastewater and once every year thereafter.

(c) The owner or operator shall make necessary repairs within 30 calendar days of identification of seals not meeting the requirements listed in sub. (11)(a)2 and 6.

(d) Except as provided in sub. (11)(f), each opening in the roof shall be equipped with a gasketed cover, seal or lid, which shall be maintained in a closed position at all times, except during inspection and maintenance.

(e) The roof shall be floating on the liquid, that is, off the roof supports, at all times except during abnormal conditions, that is, low flow rate.

(f) The floating roof may be equipped with one or more emergency roof drains for removal of stormwater. Each emergency roof drain shall be fitted with a slotted membrane fabric cover that covers at least 90% of the drain opening area or a flexible fabric sleeve seal.

(g) Access doors and other openings shall be visually inspected initially and semiannually thereafter to ensure that there is a tight fit around the edges and to identify other problems that could result in VOC emissions.

1. When a broken seal or gasket on an access door or other opening is identified, it shall be repaired as soon as practicable, but not later than 30 calendar days after it is identified, except as provided in sub. (8).

(h) An owner or operator shall notify the department in the report required by s. NR 440.07 that the owner or operator has elected to construct and operate a floating roof under pars. (a) to (g).

(i) For portions of the oil-water separator tank where it is infeasible to construct and operate a floating roof, such as the skimmer mechanism and weirs, a fixed roof meeting the requirements of sub. (5)(a) shall be installed.

(j) Except as provided in par. (i), if an owner or operator elects to comply with the provisions of this subsection, then the owner or operator does not need to comply with the provisions of sub. (5) or 40 CFR s. 60.694 applicable to the same facilities.

Note: Under 40 CFR s. 60.694, if, in the administrator s judgment, an alternative means of emission limitation will achieve a reduction in VOC emissions at least equivalent to the reduction in VOC emissions achieved by the applicable requirement in subs. (3) to (9), the administrator will publish in the Federal Register a notice permitting the use of the alterative means for purposes of compliance with that requirement. The notice may condition the permission on requirements related to the operation and maintenance of the alternative means. Any such notice shall be published only after notice and an opportunity for a hearing. Any person seeking permission under 40 CFR s. 60.694 shall collect, verify and submit to the administrator information showing that the alterative means achieves equivalent emission reductions.

(13) MONITORING OF OPERATIONS. (a) Each owner or operator subject to the provisions of this section shall install, calibrate, maintain and operate according to manufacturer's specifications the following equipment, unless alternative monitoring procedures or requirements are approved for that facility by the department.

1. Where a thermal incinerator is used for VOC emission reduction, a temperature monitoring device equipped with a continuous recorder shall be used to measure the temperature of the gas stream in the combustion zone of the incinerator. The temperature monitoring device shall have an accuracy of 1% of the measured in °C or ±0.5°C (±1.0°F), whichever is greater.

2. Where a catalytic incinerator is used for VOC emission reduction, temperature monitoring devices, each equipped with a continuous recorder, shall be used to measure the temperature in the gas stream immediately before and after the catalyst bed of the incinerator. The temperature monitoring devices shall have an accuracy of 1% of the temperature being measured in °C or ±0.5°C (±1.0°F), whichever is greater.

3. Where a carbon absorber is used for VOC emissions reduction, a monitoring device that continuously indicates and records the VOC concentration level or reading of organics in the exhaust gases of the control device outlet gas stream or inlet and outlet gas stream shall be used.

4. Where a flare is used for VOC emission reduction, the owner or operator shall comply with the monitoring requirements of s. NR 440.18(6)(b).

(b) Where a VOC recovery device other than a carbon absorber is used to meet the requirements specified in sub. (7)(a), the owner or operator shall provide to the department information describing the operation of the control device and the process parameters that would indicate proper operation and maintenance of the device. The department may request further information and will specify appropriate monitoring procedures or requirements.

(c) An alternative operational or process parameter may be monitored if it can be demonstrated that another parameter will ensure that the control device is operated in conformance with these standards and the control device's design specifications.

(14) PERFORMANCE TEST METHODS AND PROCEDURES AND COMPLIANCE PROVISIONS. (a) Before using any equipment installed in compliance with the requirements of sub. (4), (5), (6), (7), (10) or (11), the owner or operator shall inspect the equipment for indications of potential emissions, defects or other problems that may cause the requirements of this section not to be met. Points of inspection shall include, but are not limited to, seals, flanges, joints, gaskets, hatches, caps and plugs.

(b) The owner or operator of each source that is equipped with a closed vent system and control device as required in sub. (7), other than a flare, is exempt from s. NR 440.08 and shall use Method 21 of 40 CFR part 60 Appendix A, incorporated by reference in s. NR 440.17, to measure the emission concentrations, using 500 ppm as the no detectable emission limit. The instrument shall be calibrated each day before using. The calibration gases shall be:

1. Zero air (less than 10 ppm of hydrocarbon in air) and

2. A mixture of either methane or n-hexane and air at a concentration of approximately, but less than, 10,000 ppm methane or n-hexane.

(c) The owner or operator shall conduct a performance test initially and at other times as requested by the department, using the test methods and procedures in s. NR 440.18(6) to determine compliance of flares.

(d) After installing the control equipment required to meet sub. (11)(a) to (g) or whenever sources that have ceased to treat refinery wastewater for a period of 1 year or more are placed back into service, the owner or operator shall determine compliance with the standards in sub. (11)(a) to (g) as follows:

1. The maximum gap widths and maximum gap areas between the primary seal and the separator wall and between the secondary seal and the separator wall shall be determined individually within 60 calendar days of the initial installation of the floating roof and introduction of refinery wastewater or 60 calendar days after the equipment is placed back into service using the following procedure when the separator is filled to the design operating level and when the roof is floating off the roof supports.

a. Measure seal gaps around the entire perimeter of the separator in each place where a 0.32 cm (0.125 in) diameter uniform probe passes freely, without forcing or binding against seal, between the seal and the wall of the separator and measure the gap width and perimetrical distance of each such location.

b. That total surface area of each gap described in subpar. a shall be determined by using probes of various widths to measure accurately the actual distance from the wall to the seal and multiplying each such width by its respective perimetrical distance.

c. Add the gap surface area of each gap location for the primary seal and the secondary seal individually, divide the sum for each seal by the nominal perimeter of the separator basin and compare each to the maximum gap area as specified in sub. (11).

2. The gap widths and total gap area shall be determined using the procedure in subd. 1 according to the following frequency:

a. For primary seals, once every 5 years.

b. For secondary seals, once every year.

(15) RECORDKEEPING REQUIREMENTS. (a) Each owner or operator of a facility subject to the provisions of this section shall comply with the recordkeeping requirements of this subsection. All records shall be retained for a period of 2 years after being recorded unless otherwise noted.

(b) For individual drain systems subject to sub. (4), the location, date and corrective action shall be recorded for each drain when the water seal is dry or otherwise breached, when a drain cap or plug is missing or improperly installed or other problem is identified that could result in VOC emissions, as determined during the initial and periodic visual or physical inspection.

(c) For junction boxes subject to sub. (4), the location, date and corrective action shall be recorded for inspections required by sub. (4)(f) to (i) when a broken seal, gap or other problem is identified that could result in VOC emissions.

(d) For sewer lines subject to subs. (4) and (5)(e), the location, date and corrective action shall be recorded for inspections required by sub. (4)(j) to (n) and (10)(e) to (g) when a problem is identified that could result in VOC emissions.

(e) For oil-water separators subject to sub. (5), the location, date and corrective action shall be recorded for inspections required by sub. (5)(a) when a problem is identified that could result in VOC emissions.

(f) For closed vent systems subject to sub. (7) and completely closed drain systems subject to sub. (10), the location, date and corrective action shall be recorded for inspections required by sub. (7)(e) to (i) during which detectable emissions are measured or a problem is identified that could result in VOC emissions.

(g) If an emission point cannot be repaired or corrected without a process unit shutdown, the expected date of a successful repair shall be recorded.

1. The reason for the delay as specified in sub. (8) shall be recorded if an emission point or equipment problem is not repaired or corrected in the specified amount of time.

2. The signature of the owner or operator, or designee, whose decision it was that repair could not be effected without refinery or process shutdown shall be recorded.

3. The date of successful repair or corrective action shall be recorded.

(h) A copy of the design specifications for all equipment used to comply with the provisions of this section shall be kept for the life of the source in a readily accessible location.

(i) The following information pertaining to the design specifications shall be kept:

1. Detailed schematics and piping and instrumentation diagrams.

2. The dates and descriptions of any changes in the design specifications.

(j) The following information pertaining to the operation and maintenance of closed drain systems and closed vent systems shall be kept in a readily accessible location.

1. Documentation demonstrating that the control device will achieve the required control efficiency during maximum loading conditions shall be kept for the life of the facility. This documentation is to include a general description of the gas streams that enter the control device, including flow and VOC content under varying liquid level conditions, dynamic and static, and manufacturer's design specifications for the control device. If an enclosed combustion device with a minimum residence time of 0.75 seconds and a minimum temperature of 816°C (1,500°F) is used to meet the 95-percent requirement, documentation that those conditions exist is sufficient to meet the requirements of this paragraph.

2. A description of the operating parameters to be monitored to ensure that the control device will be operated in conformance with these standards and the control device's design specifications and an explanation of the criteria used for selection of those parameters shall be kept for the life of the facility.

3. Periods when the closed vent systems and control devices required in subs. (3) to (9) are not operated as designed, including periods when a flare pilot does not have a flame shall be recorded and kept for 2 years after the information is recorded.

4. Dates of startup and shutdown of the closed vent system and control devices required in subs. (3) to (9) shall be recorded and kept for 2 years after the information is recorded.

5. The dates of each measurement of detectable emissions required in subs. (3) to (11), shall be recorded and kept for 2 years after the information is recorded.

6. The background level measured during each detectable emissions measurements shall be recorded and kept for 2 years after the information is recorded.

7. The maximum instrument reading measured during each detectable emission measurement shall be recorded and kept for 2 years after the information is recorded.

8. Each owner or operator of an affected facility that uses a thermal incinerator shall maintain continuous records of the temperature of the gas stream in the combustion zone of the incinerator and records of all 3-hour periods of operation during which the average temperature of the gas stream in the combustion zone is more than 28°C (50°F) below the design combustion zone temperature and shall keep such records for 2 years after the information is recorded.

9. Each owner or operator of an affected facility that uses a catalytic incinerator shall maintain continuous records of the temperature of the gas stream both upstream and downstream of the catalyst bed of the incinerator, records of all 3-hour periods of operation during which the average temperature measured before the catalyst bed is more than 28°C (50°F) below the design gas stream temperature and records of all 3-hour periods during which the average temperature difference across the catalyst bed is less than 80% of the design temperature difference and shall keep such records for 2 years after the information is recorded.

10. Each owner or operator of an affected facility that uses a carbon absorber shall maintain continuous records of the VOC concentration level or reading of organics of the control device outlet gas stream or inlet and outlet gas stream and records of all 3-hour periods of operation during which the average VOC concentration level or reading of organics in the exhaust gases or inlet and outlet gas stream, is more than 20% greater than the design exhaust gas concentration level and shall keep such records for 2 years after the information is recorded.

(k) If an owner or operator elects to install a tightly sealed cap or plug over a drain that is out of active service, the owner or operator shall keep for the life of a facility in a readily accessible location, plans or specifications which indicate the location of such drains.

(l) For stormwater sewer systems subject to the exclusion in sub. (3)(d), an owner or operator shall keep for the life of the facility in a readily accessible location, plans or specifications which demonstrate that no wastewater from any process units or equipment is directly discharged to the stormwater sewer system.

(m) For ancillary equipment subject to the exclusion in sub. (3)(e), an owner or operator shall keep for the life of a facility in a readily accessible location, plans or specifications which demonstrate that the ancillary equipment does not come in contact with or store oily wastewater.

(n) For non-contact cooling water system subject to the exclusion in sub. (3)(f) an owner or operator shall keep for the life of the facility in a readily accessible location, plans or specifications which demonstrate that the cooling water does not contact hydrocarbons or oily wastewater and is not recirculated through a cooling tower.

(16) REPORTING REQUIREMENTS. (a) An owner or operator electing to comply with the provisions of subs. (10) and (11) shall notify the department of the alternative standard selected in the report required in s. NR 440.07.

(b) Each owner or operator of a facility subject to this section shall submit to the department within 60 days after initial startup a certification that the equipment necessary to comply with these standards has been installed and that the required initial inspections or tests of process drains, sewer lines, junction boxes, oil-water separators and closed vent systems and control devices have been carried out in accordance with these standards. Thereafter, the owner or operator shall submit to the department semiannually a certification that all of the required inspections have been carried out in accordance with these standards.

(c) Each owner or operator of an affected facility that uses a flare shall submit to the department within 60 days after initial startup, as required under s. NR 440.08(1), a report of the results of the performance test required in sub. (14)(c).

(d) A report that summarizes all inspections when a water seal was dry or otherwise breached, when a drain cap or plug was missing or improperly installed or when cracks, gaps or other problems were identified that could result in VOC emissions, including information about the repairs or corrective action taken, shall be submitted initially and semiannually thereafter to the department.

(e) As applicable, a report shall be submitted semiannually to the department that indicates:

1. Each 3-hour period of operation during which the average temperature of the gas stream in the combustion zone of a thermal incinerator, as measured by the temperature monitoring device, is more than 28°C (50°F) below the design combustion zone temperatures.

2. Each 3-hour period of operation during which the average temperature of the gas stream immediately before the catalyst bed of a catalytic incinerator, as measured by the temperature monitoring device, is more than 28°C (50°F) below the design gas stream temperature and any 3-hour period during which the average temperature difference across the catalyst bed (that is, the difference between the temperatures of the gas stream immediately before and after the catalyst bed), as measured by the temperature monitoring device, is less than 80% of the design temperature difference; or

3. Each 3-hour period of operation during which the average VOC concentration level or reading of organics in the exhaust gases from a carbon absorber is more than 20% greater than the design exhaust gas concentration level or reading.

(f) If compliance with the provisions of this section is delayed pursuant to sub. (9), the notification required under s. NR 440.07(1)(d) shall include the estimated date of the next scheduled refinery or process unit shutdown after the date of notification and the reason why compliance with the standards is technically impossible without a refinery or process unit shutdown.

SECTION 184. NR 440.71 is created to read:

NR 440.71 MAGNETIC TAPE COATING FACILITIES. (1) APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY. (a) The affected facilities to which the provisions of this section apply are:

1. Each coating operation; and

2. Each piece of coating mix preparation equipment.

(b) Any new coating operation that utilizes less than 38 m^3 of solvent or any modified or reconstructed coating operation that utilizes less than 370 m^3 of solvent for the manufacture of magnetic tape per calendar year is subject only to the requirements of subs. (5)(a) and (8)(b) and (c). If the amount of solvent utilized for the manufacture of magnetic tape equals or exceeds these amounts in any calendar year, the facility is subject to sub. (3) and all other paragraphs of this section. Once a facility has become subject to sub. (3) and all other paragraphs of this section, it shall remain subject to those requirements regardless of changes in annual solvent utilization.

(c) This section applies to any affected facility for which construction, modification or reconstruction begins after January 22, 1986.

(2) DEFINITIONS, SYMBOLS AND CROSS REFERENCE TABLES. (a) All terms used in this section that are not defined as follows have the meaning given to them in s. NR 440.02.

1. "Base film" means the substrate that is coated to produce magnetic tape.

2. "Capture system" means any device or combination of devices that contains or collects an airborne pollutant and directs it into a duct.

3. "Coating applicator" means any apparatus used to apply a coating to a continuous base film.

4. "Coating mix preparation equipment" means all mills, mixers, holding tanks, polishing tanks and other equipment used in the preparation of the magnetic coating formulation but does not include those mills that do not emit VOC because they are closed, sealed and operated under pressure.

5. "Coating operation" means any coating applicator, flashoff area and drying oven located between a base film unwind station and a base film rewind station that coat a continuous base film to produce magnetic tape.

6. "Common emission control device" means a control device controlling emissions from the coating operation as well as from another emission source within the plant.

7. "Concurrent" means construction of a control device is commenced or completed within the period beginning 6 months prior to the date construction of affected coating mix preparation equipment commences and ending 2 years after the date construction of affected coating mix preparation equipment is completed.

8. "Control device" means any apparatus that reduces the quantity of a pollutant emitted to the air.

9. "Cover" means, with respect to coating mix preparation equipment, a device that lies over the equipment opening to prevent VOC from escaping and that meets the requirements found in sub. (3)(e)1 to 5.

10. "Drying oven" means a chamber in which heat is used to bake, cure, polymerize or dry a surface coating.

11. "Equivalent diameter" means 4 times the area of an opening divided by its perimeter.

12. "Flashoff area" means the portion of a coating operation between the coating applicator and the drying oven where solvent begins to evaporate from the coated base film.

13. "Magnetic tape" means any flexible substrate that is covered on one or both sides with a coating containing magnetic particles and that is used for audio or video recording or information storage.

14. "Natural draft opening" means any opening in a room, building or total enclosure that remains open during operation of the facility and that is not connected to a duct in which a fan is installed. The rate and direction of the natural draft across such an opening is a consequence of the difference in pressures on either side of the wall containing the opening.

15. "Nominal 1-month period" means a calendar month or, if established prior to the performance test in a statement submitted with notification of anticipated startup pursuant to s. NR 440.07(1)(b), a similar monthly time period, for example, 30-day month or accounting month.

16. "Temporary enclosure" means a total enclosure that is constructed for the sole purpose of measuring the fugitive emissions from an affected facility. A temporary enclosure shall be constructed and ventilated, through stacks suitable for testing, so that it has minimal impact on the performance of the permanent capture system. A temporary enclosure will be assumed to achieve total capture of fugitive VOC emissions if it conforms to the requirements found in sub. (4)(b)5 a and if all natural draft openings are at least 4 duct or hood equivalent diameters away from each exhaust duct or hood. Alternatively, the owner or operator may apply to the administrator for approval of a temporary enclosure on a case-by-case basis.

17. "Total enclosure" means a structure that is constructed around a source of emissions so that all VOC emissions are collected and exhausted

through a stack or duct. With a total enclosure, there will be no fugitive emissions, only stack emissions. The only openings in a total enclosure are forced makeup air and exhaust ducts and any natural draft openings such as those that allow raw materials to enter and exit the enclosure for processing. All access doors or windows are closed during routine operation of the enclosed source. Brief, occasional openings of such doors or windows to accommodate process equipment adjustments are acceptable, but, if such openings are routine or if an access door remains open during the entire operation, the access door shall be considered a natural draft opening. The average inward face velocity across the natural draft openings of the enclosure shall be calculated including the area of such access doors. The drying oven itself may be part of the total enclosure. A permanent enclosure that meets the requirements found in sub. (4)(b)5 a is assumed to be a total enclosure. The owner or operator of a permanent enclosure that does not meet the requirements may apply to the department for approval of the enclosure as a total enclosure on a case-by-case basis. Such approval shall be granted upon a demonstration to the satisfaction of the department that all VOC emissions are contained and vented to the control device.

18. "Utilize" refers to the use of solvent that is delivered to coating mix preparation equipment for the purpose of formulating coatings to be applied on an affected coating operation and any other solvent, for example, dilution solvent, that is added at any point in the manufacturing process.

19. "VOC content of the coating applied" means the product of Method 24 VOC analyses or formulation data, if the data are demonstrated to be equivalent to Method 24 results, and the total volume of coating fed to the coating applicator. This quantity is intended to include all VOC that actually are emitted from the coating operation in the gaseous phase. Thus, for purposes of the liquid-liquid VOC material balance in sub. (4)(b)1, any VOC, including dilution solvent, added to the coatings shall be accounted for and any VOC contained in waste coating or retained in the final product may be measured and subtracted from the total. These adjustments are not necessary for the gaseous emission test compliance provisions of sub. (4)(b) through (j).

20. "Volatile organic compounds" or "VOC" means any organic compounds that participate in atmospheric photochemical reactions or that are measured

by Method 18, 24, 25 or 25A or an equivalent or an alternative method as defined in s. NR 440.02(5).

(b) The nomenclature used in this section has the following meaning:

1. "A_k" means the area of each natural draft opening (k) in a total enclosure, in square meters.

2. "C_{aj}" means the concentration of VOC in each gas stream (j) exiting the emission control device, in parts per million by volume.

3. "C_{bi}" means the concentration of VOC in each gas stream (i) entering the emission control device, in parts per million by volume.

4. "C_{di}" means the concentration of VOC in each gas stream (i) entering the emission control device from the affected coating operation, in parts per million by volume.

5. "C_{fk}" means the concentration of VOC in each uncontrolled gas stream (k) emitted directly to the atmosphere from the affected coating operation, in parts per million by volume.

6. "C_{gv}"means the concentration of VOC in the gas stream entering each individual carbon adsorber vessel (v), in parts per million by volume. For the purposes of calculating the efficiency of the individual adsorber vessel, C_{gv} may be measured in the carbon adsorption system's common inlet duct prior to the branching of individual inlet ducts.

7. "C_{hv}" means the concentration of VOC in the gas stream exiting each individual carbon adsorber vessel (v), in parts per million by volume.

8. "E" means the control device efficiency achieved for the duration of the emission test, expressed as a fraction.

9. "F" means the VOC emission capture efficiency of the VOC capture system achieved for the duration of the emission test, expressed as a fraction.

10. "FV" means the average inward face velocity across all natural draft openings in a total enclosure, in meters per hour.

11. "G" means the calculated weighted average mass of VOC per volume of coating solids, in kilograms per liter, applied each nominal 1-month period.

12. "H_v" means the individual carbon adsorber vessel (v) efficiency achieved for the duration of the emission test, expressed as a fraction.

13. "H_{sys}" means the carbon adsorption system efficiency calculated when each adsorber vessel has an individual exhaust stack.

14. "L_{si}" means the volume fraction of solids in each coating (i) applied during a nominal 1-month period as determined from the facility's formulation records.

15. "M_{ci}" means the total mass in kilograms of each coating (i) applied at an affected coating operation during a nominal 1-month period as determined from facility records. This quantity shall be determined at a time and location in the process after all ingredients, including any dilution solvent, have been added to the coating or appropriate adjustments shall be made to account for any ingredients added after the mass of the coating has been determined.

16. "M_r" means the total mass in kilograms of VOC recovered for a nominal 1-month period.

17. "Q_{aj}" means the volumetric flow rate of each gas stream (j) exiting the emission control device, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

18. "Q_{bi}" means the volumetric flow rate of each gas stream (i) entering the emission control device, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

19. "Q_{di}" means the volumetric flow rate of each gas stream (i) entering the emission control device from the affected coating operation, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

20. "Q_{fk}" means the volumetric flow rate of each uncontrolled gas stream (k) emitted directly to the atmosphere from the affected coating operation, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

21. "Q_{gv}" means the volumetric flow rate of the gas stream entering each individual carbon adsorber vessel (v), in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration. For purposes of calculating the efficiency of the individual

adsorber vessel, the value of Q_{gv} can be assumed to equal the value of Q_{hv} measured for that adsorber vessel.

22. "Q_{hv}" means the volumetric flow rate of the gas stream exiting each individual carbon adsorber vessel (v), in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

23. "$Q_{in\ i}$" means the volumetric flow rate of each gas stream (i) entering the total enclosure through a forced makeup air duct, in standard cubic meters per hour (wet basis).

24. "$Q_{out\ j}$" means the volumetric flow rate of each gas stream (j) exiting the total enclosure through an exhaust duct or hood, in standard cubic meters per hour (wet basis).

25. "R" means the overall VOC emission reduction achieved for the duration of the emission test, expressed as a percentage.

26. "RS_i" means the total mass (kg) of VOC retained in the coated base film after oven drying for a given magnetic tape product.

27. "V_{ci}" means the total volume in liters of each coating (i) applied during a nominal 1-month period as determined from facility records.

28. "W_{oi}" means the weight fraction of VOC in each coating (i) applied at an affected coating operation during a nominal 1-month period as determined by Method 24. This value shall be determined at a time and location in the process after all ingredients, including any dilution solvent, have been added to the coating or appropriate adjustments shall be made to account for any ingredients added after the weight fraction of VOC in the coating has been determined.

(c) Tables 1A and 1B present a cross reference of the affected facility status and the relevant subsections of the regulation.

TABLE 1A. — CROSS REFERENCE[a,b]

Status	Standard[c]	Compliance provisions[d] sub. (4)
A. Coating operation alone: New	Sub. (3)(b): Recover or destroy at least 93% of the VOC applied	(b)1, (b)2, (b)3, (b)4, (b)5, (c), (d)
Modified or reconstructed:		
1. If at least 90% of the VOC applied is recovered or destroyed prior to modification/ reconstruction	Sub. (3)(c)1 to 3: a. Maintain demonstrated level of VOC control or 93%, whichever is lower. b. If the VOC control device is subsequently replaced the new control device shall be at least 95% efficient, a demonstration shall be made that the overall level of VOC control is at least as high as required with the old control device (90 to 93%) and, if the demonstration level is higher than the old level, maintain the higher level of control (up to 93%).	(a)1, (a)3, (b)1, (b)2, (b)3, (b)4, (c), (d)
2. If existing coating operation has a total enclosure vented to a control device that is at lese 92% efficient.	Sub. (3)(c)4: a. Continue to vent all VOC emissions to the control device and maintain control efficiency at or above the demonstrated level or 95%, which is lower. b. If the VOC control device is subsequently replaced, the new control device shall be at least 95% efficient and all VOC emissions shall be vented from the total enclosure to the new control device.	(a)2, (b)5, (c), (d)
3. If existing coating operation is not in the previous 2 categories.	Sub. (3)(d): Recover or destroy at least 93% of the VOC applied....	(b)1, (b)2, (b)3, (b)4, (b)5, (c), (d)
B. Coating mix preparation equipment alone:		
New:		
1. With concurrent construction of new VOC control device (other than a condenser) on the coating operation.	Sub. (3)(e): Install and use covers and vent to a control device that is at least 95% efficient[e].	(b)6
2. Without concurrent construction of new VOC control device on the coating operation or with concurrent construction of a condenser.	Sub. (3)(f)1 or 2: Install and use covers and vent to a control device or install and use covers[e].	(b)7, (b)8
Modified or reconstructed....	Sub. (3)(f)1 or 2: Install and use covers and vent to a control device or install and use covers[e].	(h), (i)
C. Both coating operation and coating mix preparation equipment: New and modified or reconstructed.	Sub. (3)(g): In lieu of standards in sub. (3)(a)-(f), use coatings containing a maximum of 0.20 kg VOC per liter of coating solids.	(b)9

---

[a] This table is presented for the convenience of the user and is not intended to supersede the language of the regulation. For the details of the requirements, refer to the text of the regulation.

[b] Refer to Part B to determine which paragraphs of subs. (5), (6) and (8) correspond to each compliance provision (sub. (4)).

[c]As per sub. (1)(b), any new coating operation with solvent utilization <38 m^3/yr or any modified or reconstructed coating operation with solvent utilization <370 m^3/yr is exempt from the VOC standards (sub. (3)). Such coating operations are subject only to subs. (5)(a) and (8)(b) and (c). However, should a coating operation once exceed the applicable annual solvent utilization cutoff, that coating operation shall be subject to the VOC standards (sub. (3)) and all other applicable subsections. Once this has occurred, the coating operation shall remain subject to those requirements regardless of changes in annual solvent utilization.

[d]As applicable

[e]Sub. (7) permits the use of an alternative means of VOC emission limitation that achieves an equivalent or greater VOC emission reduction.

TABLE 1B — CROSS REFERENCE

Compliance provisions[a] sub. (4)	Test methods-sub. (6)	Category/ equipment[b]	Installation of monitoring devices and recordkeeping sub. (5)	Reporting and monitoring requirements[c] sub. (8)
A. Coating operation alone: (b)1. - When emissions from only the affected coating operation are controlled by a solvent recovery device, perform a liquid-liquid VOC material balance.	(a)		(b), (i), (k)	(a), (d)1, (e), (h), (i)
(b)2. - When emissions from only the affected coating operation are controlled by an incinerator or when a common emission control device (other than a carbon adsorption system with individual exhaust stacks for each adsorber vessel) is used to control emissions from an affected coating operation as well as from other sources of VOC, perform a gaseous emission test.	(b)-(g)	General	(i),(k)	(a), (e), (h), (i)
		CA	(c)	(d)3, (d)4
		CO	(d)	(d)5
		TI	(e)	(d)6
		CI	(f)	(d)7
		PE,TE	(g)	(d)8
(b)3. - When emissions from both the affected coating operation and from other sources of VOC are controlled by a carbon absorption system with individual exhaust stacks for each adsorber vessel, perform a gaseous emission test.	(b)-(g)	General	(i), (k)	(a), (e), (h), (i)
		CA	(c)	(d)3, (d)4
		PE, TE	(g)	(d)8
(b)4. - When emissions from more than one affected coating operation are vented through the same duct to a control device also controlling emissions from nonaffected sources that are vented separately from the affected coating operations, consider the combined affected coating operations as a single emission source and conduct a compliance test described in sub. (4)(b)2 or (b)3.	(b)-(g)	General	(i), (k)	(a), (e), (h), (i)
		CA	(c)	(d)3, (d)4
		CO	(d)	(d)5
		TI	(e)	(d)6
		CI	(f)	(d)7
		PE,TE	(g)	(d)8
(b)5. - Alternative to sub. (4)(b)1 to (b)4: Demonstrate that a total enclosure is installed around the coating operation and that all VOC emissions are vented to a control device with the specified efficiency.	(b)-(g)	General	(i)(k)	(a), (e) (h), (i)
		CA	(c)	(d)3, (d)4
		CO	(d)	(d)5
		TI	(e)	(d)6
		CI	(f)	(d)7
		TE	(h)	(d)8
B. Coating mix preparation equipment alone:				
(b)6. - Demonstrate that covers meeting the requirements of sub. (3)(e)1 to 5 are installed and used properly; procedures detailing the proper use of covers are posted; the mix equipment is vented to a control device; and the control device efficiency is greater than or equal to 95%.	(b)-(g)	General	(k)	(a),(e),(h),(i)
		CA	(c)	(d)3, (d)4
		TI	(e)	(d)6
		CI	(f)	(d)7
(b)7. - Demonstrate that covers meeting the requirements of sub. (3)(c)1 to 5 are installed and used properly; procedures detailing the proper use of covers are posted; and the mix equipment is vented to a control device.				
(b)8. - Demonstrate that covers meeting the requirement of sub. (3)(c)1 to 5 are installed and used properly and that procedures detailing the proper use of the covers are posted.				
C. Both coating operation and coating mix preparation equipment: (b)9. Determine that weighted average mass of VOC in the coating per volume of coating solids applied for each month.	(a)		(i),(j) (k)	(d)2,(e),(g),(h),(i)

---

[a]Sub. (4)(a) specifies the procedures to be used prior to modification/reconstructionto establish the applicability of the VOC standards in sub. (3)(c) for modified/reconstructed coating operations. Sub. (4)(a)1 requires the use of the procedures of sub. (4)(b)1, 2, 3 or 4, to demonstrate prior to modification/reconstructionthat 90% of the applied VOC is recovered or destroyed. Sub. (4)(a)2 requires the use of procedures of sub. (4)(b)5 to demonstrate prior to modification/reconstructionthat the coating operation has a total enclosure vented to a control device that is at least 92% efficient. Sub. (4)(k) and (l) do not have corresponding test methods, monitoring, reporting or recordkeeping requirements.

[b]TI = thermal incinerator, CI = catalytic incinerator; CA = carbon adsorber; CO = condenser; PE = partial enclosure; TE = total enclosure.

[c]See sub. (8)(f) for additional reporting requirements when coating mix preparation equipment is constructed at a time when no coating operation is being constructed. See sub. (8)(g) for addition reporting requirements when coating mix preparation equipment is constructed at the same time as an affected coating operation.

(3) STANDARDS FOR VOLATILE ORGANIC COMPOUNDS. (a) Each owner or operator of any affected facility that is subject to the requirements of this section shall comply with the emission limitations in this subsection on and after the date on which the initial performance test required by s. NR 440.08 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated or 180 days after initial startup, whichever date comes first.

(b) Each owner or operator shall control emissions from a new coating operation by recovering or destroying at least 93% of the VOC content of the coating applied at the coating applicator.

(c) Each owner or operator of a modified or reconstructed coating operation shall meet the appropriate standard in subds. 1 to 3, 4 or par. (d).

1. For coating operations demonstrated prior to modification or reconstruction pursuant to sub. (4)(a)1 to have emissions controlled by the recovery or destruction of at least 90% of the VOC content of the coating applied at the coating applicator.

2. Subject to the provisions of subd. 3, each owner or operator shall continue to control emissions from the coating operation to at least the demonstrated level or 93%, whichever is lower.

3. If the VOC control device in use during the emission reduction demonstration made pursuant to sub. (4)(a)1 is subsequently replaced, each owner or operator shall:

a. Install a control device that is at least 95% efficient; and

b. Control emissions from the coating operation to at least the level determined pursuant to sub. (4)(a)3 b.

4. For coating operations demonstrated prior to modification or reconstruction pursuant to sub. (4)(a)2 to have a total enclosure installed around the coating operation and all VOC emissions ventilated to a control device that is at least 92% efficient.

a. Subject to the provisions of subpar. b, each owner or operator shall continue to ventilate all VOC emissions from the total enclosure to the control device and maintain control device efficiency at or above the demonstrated level or 95%, whichever is lower.

b. If the VOC control device in use during the control device efficiency demonstration made pursuant to sub. (4)(a)2 is subsequently replaced, each owner or operator shall install a VOC control device that is at least 95%

efficient and ventilate all VOC emissions from the total enclosure to the control device.

(d) For coating operations not subject to par. (c)1 to 4, each owner or operator shall control emissions from the coating operation by recovering or destroying at least 93% of the VOC content of the coating applied at the coating applicator.

(e) Each owner or operator constructing new coating mix preparation equipment with concurrent construction of a new VOC control device, other than a condenser, on a magnetic tape coating operation shall control emissions from the coating mix preparation equipment by installing and using a cover on each piece of equipment and venting the equipment to a 95% efficient control device. Each cover shall meet the following specifications:

1. Cover shall be closed at all times except when adding ingredients, withdrawing samples, transferring the contents or making visual inspection when such activities cannot be carried out with cover in place. Such activities shall be carried out through ports of the minimum practical size.

2. Cover shall extend at least 2 cm beyond the outer rim of the opening or shall be attached to the rim;

3. Cover shall be of such design and construction that contact is maintained between cover and rim along the entire perimeter;

4. Any breach in the cover, such as an opening for insertion of a mixer shaft or port for addition of ingredients, shall be covered consistent with par. (c)2 and 3, when not actively in use. An opening sufficient to allow safe clearance for a mixer shaft is acceptable during those periods when the shaft is in place; and

5. A polyethylene or nonpermanent cover may be used provided it meets the requirements of par. (c)2 to 4. A cover may not be reused after once being removed.

(f) Each owner or operator of affected coating mix preparation equipment not subject to par. (e) shall control emissions from the coating mix preparation equipment by either:

1. Installing and using a cover that meets the specifications in par. (c)1 to 5 and venting VOC emissions from the equipment to a VOC control device; or

2. Installing and using a cover that meets the specifications in par. (c)1 to 5.

(g) In lieu of complying with pars. (b) to (f), each owner or operator may use coatings that contain a maximum of 0.20 kg of VOC per liter of coating solids as calculated on a weighted average basis for each nominal 1-month period.

(4) COMPLIANCE PROVISIONS. (a) The determination of the applicability of sub. (3)(c), standards for modified or reconstructed coating operations, and determination of control level required in sub. (3)(c)3 b is as follows:

1. To establish applicability of sub. (3)(c)1 to 3, each owner or operator shall demonstrate, prior to modification or reconstruction, that at least 90% of the VOC content of the coating applied at the coating applicator is recovered or destroyed. The demonstration shall be made using the procedures of par. (b)1, 2, 3 or 4, as appropriate.

2. To establish applicability of sub. (3)(c)4, each owner or operator shall demonstrate, prior to modification or reconstruction, that a total enclosure is installed around the existing coating operation and that all VOC emissions are ventilated to a control device that is at least 92% efficient. The demonstration shall be made using the procedures of par. (b)5.

3. To determine the level of control required in sub. (3)(c)3 b, the owner or operator shall demonstrate:

a. That the VOC control device subsequently installed is at least 95% efficient. Such demonstration shall be made using Equation (2) specified in par. (b)2 d or Equations (4) and (5) specified in par. (b)3 d and e, as applicable and the test methods and procedures specified in sub. (6)(b) to (g); and

b. That the overall level of control after the VOC control device is installed is at least as high as the level demonstrated prior to modification or reconstruction pursuant to par. (a)1. Demonstrations shall be made using the procedures of par. (b)1, 2, 3 or 4, as appropriate. The required overall level of control subsequent to this demonstration shall be the level so demonstrated or 93%, whichever is lower.

(b) The compliance demonstrations for sub. (3)(b), (c)1 to 3, 4, (d), (e), (f) and (g) are made as follows:

1. To demonstrate compliance with sub. (3)(b), (c)1 to 3 or (d), standards for coating operations, when emissions from only the affected coating operations are controlled by a dedicated solvent recovery device, each owner or operator of the affected coating operation shall perform a liquid-liquid VOC material balance over each and every nominal 1-month period. When demonstrating compliance by this procedure, s. NR 440.08(6) does not apply. The amount of liquid VOC applied and recovered shall be determined as

discussed in subpar. c. The overall VOC emission reduction (R) is calculated using the following equation:

$$R = \frac{M_r}{\sum_{i=1}^{n} (W_{oi}\ M_{ci} - RS_i)} \times 100 \qquad \text{(Equation 1)}$$

a. The value of RS_i is zero unless the owner or operator submits the following information to the administrator for approval of a measured value of RS_i, that is greater than zero:

1) Measurement techniques; and

2) Documentation that the measured value of RS_i exceeds zero.

b. The measurement techniques of subpar. a 1) shall be submitted to the administrator for approval with the notification of anticipated startup required under s. NR 440.07(1)(b).

c. Each owner or operator demonstrating compliance by the test method described in subd. 1 shall:

1) Measure the amount of coating applied at the coating applicator;

2) Determine the VOC content of all coatings applied using the test method specified in sub. (6)(a);

3) Install, calibrate, maintain and operate, according to the manufacturer's specifications, a device that indicates the cumulative amount of VOC recovered by the solvent recovery device over each nominal 1-month period. The device shall be certified by the manufacturer to be accurate to within ±2.0%;

4) Measure the amount of VOC recovered; and

5) Calculate the overall VOC emission reduction (R) for each and every nominal 1-month period using Equation 1.

d. For facilities subject to sub. (3)(b) or (d), compliance is demonstrated if the value of R is equal to or greater than 93%.

e. Subject to the provisions of subpar. 1 f, for facilities subject to sub. (3)(c)1 to 3, compliance is demonstrated if the value of R is equal to or greater than the percent reduction demonstrated pursuant to par. (a)1 prior to modification or reconstruction or 93% whichever is lower.

f. For facilities subject to sub. (3)(c)3, compliance is demonstrated if the value of E (control device efficiency) is greater than or equal to 0.95

and if the value of R is equal to or greater than the percent reduction demonstrated pursuant to par. (a)3 or 93%, whichever is lower.

2. To demonstrate compliance with sub. (3)(b), (c)1 to 3 or (d), standards for coating operations, when the emissions from only an affected coating operation are controlled by a dedicated incinerator or when a common emission control device, other than a fixed-bed carbon adsorption system with individual exhaust stacks for each adsorber vessel, is used to control emissions from an affected coating operation as well as from other sources of VOC, each owner or operator of an affected coating operation shall perform a gaseous emission test using the following procedures:

a. Construct the overall VOC emission reduction system so that all volumetric flow rates and total VOC emissions can be accurately determined by the applicable test methods and procedures specified in sub. (6)(b) to (g);

b. Determine capture efficiency from the coating operation by capturing, venting and measuring all VOC emissions from the operation. During a performance test, the owner or operator of an affected coating operation located in an area with other sources of VOC shall isolate the coating operation emissions from all other sources of VOC by one of the following methods:

1) Build a temporary enclosure around the affected coating operation; or

Note: See sub. (2)(a)16.

2) Shut down all other sources of VOC and continue to exhaust fugitive emissions from the affected coating operation through any building ventilation system and other room exhausts such as drying ovens. All ventilation air shall be vented through stacks suitable for testing;

c. Operate the emission control device with all emission sources connected and operating;

d. Determine the efficiency (E) of the control device using the following equation:

$$E = \frac{\sum_{i=1}^{n} Q_{bi}C_{bi} - \sum_{j=1}^{p} Q_{aj}C_{aj}}{\sum_{i=1}^{n} Q_{bi}C_{bi}} \qquad \text{(Equation 2)}$$

e. Determine the efficiency (F) of the VOC capture system using the following equation:

$$F = \frac{\sum_{i=1}^{n} Q_{bi}C_{bi}}{\sum_{i=1}^{n} Q_{di}C_{di} + \sum_{k=1}^{p} Q_{fk}C_{fk}} \qquad \text{(Equation 3)}$$

f. For each affected coating operation subject to sub. (3)(b) or (d), compliance is demonstrated if the product of (E)×(F) is equal to or greater than 0.93.

g. For each affected coating operation subject to sub. (3)(c)2, compliance is demonstrated if the product of (E)×(F) is equal to or greater than the fractional reduction demonstrated pursuant to par. (a)1 prior to modification or reconstruction or 0.93, whichever is lower.

h. For each affected coating operation subject to sub. (3)(c)3, compliance is demonstrated if the value of E is greater than or equal to 0.95 and if the product of (E)×(F) is equal to or greater than the fractional reduction demonstrated pursuant to par. (a)3 or 0.93, whichever is lower.

3. To demonstrate compliance with sub. (3)(b), (c)1 to 3 or (d), standards for coating operations, when a fixed-bed carbon adsorption system with individual exhaust stacks for each adsorber vessel is used to control emissions from an affected coating operation as well as from other sources of VOC, each owner or operator of an affected coating operation shall perform a gaseous emission test using the following procedures:

a. Construct the overall VOC emission reduction system so that each volumetric flow rate and the total VOC emissions can be accurately determined by the applicable test methods and procedures specified in sub. (6)(b) to (g);

b. Assure that all VOC emissions from the coating operation are segregated from other VOC sources and that the emissions can be captured for measurement, as described in subd. 2 b 1) and 2);

c. Operate the emission control device with all emission sources connected and operating;

d. Determine the efficiency (H_v) of each individual adsorber vessel (v) using the following equation:

$$H_v = \frac{Q_{gv}C_{gv} - Q_{hv}C_{hv}}{Q_{gv}C_{gv}} \qquad \text{(Equation 4)}$$

e. Determine the efficiency of the carbon adsorption system (H_{sys}) by computing the average efficiency of the adsorber vessels as weighted by the volumetric flow rate (Q_{hv}) of each individual adsorber vessel (v) using the following equation:

$$H_{sys} = \frac{\sum_{V=1}^{q} H_v Q_{hv}}{\sum_{V=1}^{q} Q_{hv}} \qquad \text{(Equation 5)}$$

f. Determine the efficiency (F) of the VOC capture system using Equation (3).

g. For the affected coating operation subject to sub. (3)(b) or (d), compliance is demonstrated if the product of (H_{sys})×(F) is equal to or greater than 0.93.

h. For the affected coating operation subject to sub. (3)(c)2, compliance is demonstrated if the product of (H_{sys})×(F) is equal to or greater than the fractional reduction demonstrated pursuant to par. (a)1 prior to modification or reconstruction or 0.93, whichever is lower.

i. For each affected coating operation subject to sub. (3)(c)3, compliance is demonstrated if the value of H_{sys} is greater than or equal to 0.95 and if the product of (H_{sys})×(F) is equal to or greater than the fractional reduction demonstrated pursuant to par. (a)3 or 0.93, whichever is lower.

4. To demonstrate compliance with sub. (3)(b), (c)1 to 3 or (d), standards for coating operations, when the VOC emissions from more than one affected coating operation are collected by a common capture system and are vented through a common duct to a control device that is also controlling emissions from nonaffected sources and the emissions from the nonaffected sources are vented separately from the affected coating operations, the owner or operator may:

a. Consider the combined affected coating operations as single emission source; and

b. Conduct a compliance test on this single source by the methods described in subd. 2 or 3, as applicable.

5. An alternative method of demonstrating compliance with sub. (3)(b) or (d), standards for coating operations, and the sole method of demonstrating compliance with sub. (3)(c)4, standards for modified or reconstructed coating operations, is the installation of a total enclosure around the coating operation and the ventilation of all VOC emissions from the total enclosure to a control device with the efficiency specified in par. (b)5 c 1) or 2), as applicable. If this method is selected, the compliance test methods described in par. (b)1 to 4 are not required. Instead, each owner or operator of an affected coating operation shall:

a. Demonstrate that a total enclosure is installed. An enclosure that meets the requirements in subpar. a 1) to 4) shall be assumed to be a total enclosure. The owner or operator of an enclosed coating operation that does not meet the requirements may apply to the administrator for approval of the enclosure as a total enclosure on a case-by-case basis. The enclosure shall be considered a total enclosure if it is demonstrated to the satisfaction of the administrator that all VOC emissions from the affected coating operation are contained and vented to the control device. The requirements for automatic approval are as follows:

1) Total area of all natural draft openings may not exceed 5% of the total surface area of the total enclosure's walls, floor and ceiling;

2) All sources of emissions within the enclosure shall be a minimum of 4 equivalent diameters away from each natural draft opening;

3) Average inward face velocity across all natural draft openings (FV) shall be a minimum of 3,600 meters per hour as determined by the following procedures:

a) Construct all forced makeup air ducts and all exhaust ducts so that the volumetric flow rate in each can be accurately determined by the test methods and procedures specified in sub. (6)(c) and (d). Volumetric flow rates shall be calculated without the adjustment normally made for moisture content; and

b) Determine FV by the following equation:

$$FV = \frac{\sum_{j=1}^{n} Q_{out\ j} - \sum_{i=1}^{p} Q_{in\ i}}{\sum_{k=1}^{q} A_k} \qquad \text{(Equation 6)}$$

4) The air passing through all natural draft openings shall flow into the enclosure continuously. If FV is less than or equal to 9,000 meters per hour, the continuous inward flow of air shall be verified by continuous observation using smoke tubes, streamers, tracer gases or other means approved by the administrator over the period that the volumetric flow tests required to determine FV are carried out. If FV is greater than 9,000 meters per hour, the direction of airflow through the natural draft openings shall be presumed to be inward at all times without verification.

b. Determine the control device efficiency using Equation (2) or Equations (4) and (5), as applicable and the test methods and procedures specified in sub. (6)(b) to (g).

c. Compliance is demonstrated if the installation of a total enclosure is demonstrated and the value of E determined from Equation (2), or the value of H_{sys} determined from Equations (4) and (5), as applicable, is equal to or greater than the required efficiency as follows:

1) For coating operations subject to the standards of sub. (3)(b), (c)4 b and (d), 0.95 (95%); or

2) For coating operations subject to the standards of sub. (3)(c)4 a, the value of E determined from Equation (2), or the value of H_{sys} determined from Equations (4) and (5), as applicable, pursuant to par. (a)2 prior to modification or reconstruction or 0.95 (95%), whichever is lower.

6. To demonstrate compliance with sub. (3)(e) (standard for new mix equipment with concurrent construction of a control device), each owner or operator of affected coating mix preparation equipment shall demonstrate upon inspection that:

a. Covers satisfying the requirements of sub. (3)(e)1 to 5 have been installed and are being used properly;

b. Procedures detailing the proper use of covers, as specified in sub. (3)(c)1, have been posted in all areas where affected coating mix preparation equipment is used;

c. The coating mix preparation equipment is vented to a control device; and

d. The control device efficiency (E or H_{sys}, as applicable) determined using Equation (2) or Equations (4) and (5), respectively and the test methods and procedures specified in sub. (6)(b) to (g) is equal to or greater than 0.95.

7. To demonstrate compliance with sub. (3)(f)1, standard for mix equipment, each owner or operator of affected coating mix preparation equipment shall demonstrate upon inspection that:

a. Covers satisfying the requirements of sub. (3)(e)1 to 5 have been installed and are being used properly;

b. Procedures detailing the proper use of covers, as specified in sub. (3)(c)1, have been posted in all areas where affected coating mix preparation equipment is used; and

c. The coating mix preparation equipment is vented to a control device.

8. To demonstrate compliance with sub. (3)(f)2, standard for mix equipment, each owner or operator of affected coating mix preparation equipment shall demonstrate upon inspection that both:

a. Covers satisfying the requirements of sub. (3)(e)1 to 5 have been installed and are being used properly; and

b. Procedures detailing the proper use of covers, as specified in sub. (3)(c)1, have been posted in all areas where affected coating mix preparation equipment is used.

9. To determine compliance with sub. (3)(g), high-solids coatings alternative standard, each owner or operator of an affected facility shall determine the weighted average mass of VOC contained in the coating per volume of coating solids applied for each and every nominal 1-month period according to the following procedures:

a. Determine the weight fraction of VOC in each coating applied using Method 24 as specified in sub. (6)(a);

b. Determine the volume of coating solids in each coating applied from the facility records; and

c. Compute the weighted average by the following equation:

$$G = \frac{\sum_{i=1}^{n} W_{oi} M_{ci}}{\sum_{i=1}^{n} L_{si} V_{ci}} \qquad \text{(Equation 7)}$$

d. For each affected facility where the value of G is less than or equal to 0.20 kilogram of VOC per liter of coating solids applied, the facility is in compliance.

(c) Startups and shutdowns are normal operation for this source category. Emissions from these operations are to be included when determining if the standards for coating operations specified in sub. (3)(b) to (d) are being attained.

(d) If a control device other than a carbon adsorber, condenser or incinerator is used to control emissions from an affected facility, the necessary operating specifications for that device shall be obtained from the administrator. An example of such a device is a flare.

(5) INSTALLATION OF MONITORING DEVICES AND RECORDKEEPING. All monitoring devices required under the provisions of this subsection shall be installed and calibrated, according to the manufacturer's specifications, prior to the initial performance tests in locations such that representative values of the monitored parameters will be obtained. The parameters to be monitored shall be continuously measured and recorded during all performance tests.

(a) Each owner or operator of an affected coating operation that utilizes less solvent annually than the applicable cutoff provided in sub. (1)(b) and that is not subject to sub. (3), standards for coating operations, shall both:

1. Make semiannual estimates of the projected annual amount of solvent to be utilized for the manufacture of magnetic tape at the affected facility in that calendar year and maintain records of these estimates; and

2. Maintain records of actual solvent use.

(b) Each owner or operator of an affected coating operation demonstrating compliance by the test method described in sub. (4)(b)1, liquid material balance, shall maintain records of all the following for each and every nominal 1-month period:

1. Amount of coating applied at the applicator;

2. Results of the reference test method specified in sub. (6)(a) for determining the VOC content of all coatings applied;

3. Amount VOC recovered; and

4. Calculation of the percent VOC recovered.

(c) Each owner or operator of an affected coating operation or affected coating mix preparation equipment controlled by a carbon adsorption system and demonstrating compliance by the procedures described in sub. (4)(b)2, 3, 4, 5 or 6, which include control device efficiency determinations, shall carry out the monitoring and recordkeeping provisions of subd. 1 or 2, as appropriate.

1. For carbon adsorption systems with a common exhaust stack for all the individual adsorber vessels, install, calibrate, maintain and operate,

according to the manufacturer's specifications, a monitoring device that continuously indicates and records the concentration level of organic compounds in either the control device outlet gas stream or in both the control device inlet and outlet gas streams. The outlet gas stream would be monitored if the percent increase in the concentration level of organic compounds is used as the basis for reporting, as described in sub. (8)(d)3. The inlet and outlet gas streams would be monitored if the percent control device efficiency is used as the basis for reporting, as described in sub. (8)(d)4.

2. For carbon adsorption systems with individual exhaust stacks for each adsorber vessel, install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the concentration level of organic compounds in the outlet gas stream for a minimum of one complete adsorption cycle per day for each adsorber vessel. The owner or operator may also monitor and record the concentration level of organic compounds in the common carbon adsorption system inlet gas stream or in each individual carbon adsorber vessel inlet stream. The outlet gas streams alone would be monitored if the percent increase in the concentration level of organic compounds is used as the basis for reporting, as described in sub. (8)(d)3. In this case, the owner or operator shall compute daily a 3-day rolling average concentration level of organics in the outlet gas stream from each individual adsorber vessel. The inlet and outlet gas streams would be monitored if the percent control device efficiency is used as the basis for reporting, as described in sub. (8)(d)4. In this case, the owner or operator shall compute daily a 3-day rolling average efficiency for each individual adsorber vessel.

(d) Each owner or operator of an affected coating operation controlled by condensation system and demonstrating compliance by the procedures described in sub. (4)(b)2, 4 or 5, which include control device efficiency determinations, shall install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the temperature of the condenser exhaust stream.

(e) Each owner or operator of an affected coating operation or affected coating mix preparation equipment controlled by a thermal incinerator and demonstrating compliance by the procedures described in sub. (4)(b)2, 4, 5 or 6, which include control device efficiency determinations, shall install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the combustion temperature of the incinerator. The monitoring device shall have an accuracy within ±1% of the temperature being measured in Celsius degrees.

(f) Each owner or operator of an affected coating operation or affected coating mix preparation equipment controlled by a catalytic incinerator and demonstrating compliance by the procedures described in sub. (4)(b)2, 4, 5 or 6, which include control device efficiency determinations, shall install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the gas temperature both upstream and downstream of the catalyst bed. The monitoring device shall have an accuracy with ±1% of the temperature being measured in Celsius degrees.

(g) Each owner or operator of an affected coating operation demonstrating compliance pursuant to sub. (4)(b)2, 3 or 4, which include VOC capture system efficiency determinations, shall submit a monitoring plan for the VOC capture system to the department for approval along with notification of anticipated startup required under s. NR 440.07(1)(b). This plan shall identify the parameter to be monitored as an indicator of VOC capture system performance, for example the amperage to the exhaust fans or duct flow rates, and the method for monitoring the chosen parameter. The owner or operator shall install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the value of the chosen parameter.

(h) Each owner or operator of an affected coating operation who uses the equipment alternative described in sub. (4)(b)5 to demonstrate compliance shall follow the procedures described in par. (g) to establish a monitoring plan for the total enclosure.

(i) Each owner or operator of an affected coating operation shall record time periods of coating operations when an emission control device is not in use.

(j) Each owner or operator of an affected coating operation or affected coating mix preparation equipment complying with sub. (3)(g) shall maintain records of the monthly weighted average mass of VOC contained in the coating per volume of coating solids applied for each coating as described in sub. (4)(b)9 a to d.

(k) Records of the measurements and calculations required in sub. (4) and this subsection shall be retained for at least 2 years following the date of the measurements and calculations.

(6) TEST METHODS AND PROCEDURES. Methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, except as provided under s. NR 440.08(2), shall be used to determine compliance as follows:

(a) Method 24 is used to determine the VOC content in coatings. If it is demonstrated to the satisfaction of the administrator that plant coating formulation data are equivalent to Method 24 results, formulation data may be used. In the event of any inconsistency between a Method 24 test and a facility's formulation data, the Method 24 test will govern. For Method 24, the coating sample shall be a 1-liter sample taken into a 1-liter container at a location and time such that the sample will be representative of the coating applied to the base film, that is, the sample shall include any dilution solvent or other VOC added during the manufacturing process. The container shall be tightly sealed immediately after the sample is taken. Any solvent or other VOC added after the sample is taken shall be measured and accounted for in the calculations that use Method 24 results.

(b) Method 18, 25 or 25A, as appropriate to the conditions at the site, is used to determine VOC concentration. The owner or operator shall submit notice of the intended test method to the administrator for approval along with the notification of the performance test required under s. NR 440.08(2). Method selection shall be based on consideration of the diversity of organic species present and their total concentration and on consideration of the potential presence of interfering gases. Except as indicated in par. (b)1 and 2, the test shall consist of 3 separate runs, each lasting a minimum of 30 minutes.

1. When the method is to be used in the determination of the efficiency of a fixed-bed carbon adsorption system with a common exhaust stack for all the individual adsorber vessels pursuant to sub. (4)(b)2, 4, 5 or 6, the test vessel shall consist of 3 separate runs, each coinciding with one or more complete sequences through the adsorption cycles of all the individual adsorber vessels.

2. When the method is to be used in the determination of the efficiency of a fixed-bed carbon adsorption system with individual exhaust stacks for each adsorber vessel pursuant to sub. (4)(b)3, 4, 5 or 6, each adsorber vessel shall be tested individually. The test for each adsorber vessel shall consist

of 3 separate runs. Each run shall coincide with one or more complete adsorption cycles.

(c) Method 1 or 1A is used for sample and velocity traverses.

(d) Method 2, 2A, 2C or 2D is used for velocity and volumetric flow rates.

(e) Method 3 is used for gas analysis.

(f) Method 4 is used for stack gas moisture.

(g) Methods 2, 2A, 2C, 2D, 3 and 4 shall be performed, as applicable, at least twice during each test period.

Note: Under 40 CFR s. 60.716, if, in the administrator s judgment, an alternative means of emission limitation will achieve a reduction in emissions of VOC from any emission point subject to sub. (3)(e) or (f) (standards for mix equipment) at least equivalent to that required by sub. (3)(e) or (f), respectively, the administrator will publish in the Federal Register a notice permitting the use of the alternative means. The notice may condition permission on requirements related to the operation and maintenance of the alternative means. Any such notice shall be published only after public notice and an opportunity for a public hearing. Any person seeking permission under 40 CFR s. 60.716 shall submit either results from an emission test that documents the collection and measurement of all VOC emissions from a given control device or an engineering evaluation that documents the determination of such emissions.

(8) REPORTING AND MONITORING REQUIREMENTS. (a) For all affected coating operations subject to sub. (3)(b), (c)1 to 3, 4 or (d) and all affected coating mix preparation equipment subject to sub. (3)(e), the performance test data and results shall be submitted to the department as specified in s. NR 440.08(1). In addition, the average values of the monitored parameters measured at least every 15 minutes and averaged over the period of the performance test shall be submitted with the results of all performance tests.

(b) Each owner or operator of an affected coating operation claiming to utilize less than the applicable volume of solvent specified in sub. (1)(b) in the first calendar year of operation shall submit to the department, with the notification of projected startup, a material flow chart indicating projected solvent use. The owner or operator shall also submit actual solvent use records at the end of the initial calendar year.

(c) Each owner or operator of an affected coating operation initially utilizing less than the applicable volume of solvent specified in sub. (1)(b) per calendar year shall:

1. Report the first calendar year in which actual annual solvent use exceeds the applicable volume; and

2. Report the first semiannual estimate in which annual solvent use would exceed the applicable volume.

(d) Each owner or operator of an affected coating operation or affected coating mix preparation equipment subject to sub. (3)(e), shall submit quarterly reports to the department documenting the following:

1. The 1-month amount of VOC contained in the coating, the VOC recovered and the percent emission reduction for months of noncompliance for any affected coating operation demonstrating compliance by the performance test method described in sub. (3)(g), liquid material balance;

2. The VOC contained in the coatings for the manufacture of magnetic tape for any 1-month period during which the weighted average solvent content (G) of the coatings exceeded 0.20 kilogram per liter of coating solids for those affected facilities complying with sub. (3)(g), high-solids coatings alternative standard;

3. For those affected facilities monitoring only the carbon adsorption system outlet concentration levels of organic compounds, the periods, during actual coating operations specified in subpar. a or b, as applicable.

a. For carbon adsorption systems with a common exhaust stack for all the individual adsorber vessels, all periods of 3 consecutive adsorption cycles of all the individual adsorber vessels during which the average value of the concentration level of organic compounds in the common outlet gas stream is more than 20% greater than the average value measured during the most recent performance test that demonstrated compliance.

b. For carbon adsorption systems with individual exhaust stacks for each adsorber vessel, all 3-day rolling averages for each adsorber vessel when the concentration level of organic compounds in the individual outlet gas stream is more than 20% greater than the average value for that adsorber vessel measured during the most recent performance test that demonstrated compliance.

4. For those affected facilities monitoring both the carbon adsorption system inlet and outlet concentration levels of organic compounds, the periods, during actual coating operations, specified in par. (d)4 a or b, as applicable.

a. For carbon adsorption systems with a common exhaust stack for all the individual adsorber vessels, all periods of 3 consecutive adsorption cycles of all the individual adsorber vessels during which the average carbon adsorption system efficiency falls below the applicable level as follows:

1) For those affected facilities demonstrating compliance by the performance test method described in sub. (4)(b)2 or 4, the value of E determined using Equation (2) during the most recent performance test that demonstrated compliance.

2) For those affected facilities demonstrating compliance pursuant to sub. (4)(b)5 c 1) or 6, 0.95 (95%).

3) For those affected facilities demonstrating compliance pursuant to sub. (4)(b)5 c 2), the required value of E determined using Equation (2) pursuant to sub. (4)(a)2 prior to modification or reconstruction or 0.95 (95%), whichever is lower.

b. For carbon adsorption systems with individual exhaust stacks for each adsorber vessel, all 3-day rolling averages for each adsorber vessel when the efficiency falls below the applicable level as follows:

1) For those affected facilities demonstrating compliance by the performance test method described in sub. (4)(b)3 or 4, the value of H_v determined using Equation (4) during the most recent performance test that demonstrated compliance.

2) For those affected facilities demonstrating compliance pursuant to sub. (4)(b)5 c 1) or 6, 0.95 (95%).

3) For those affected facilities demonstrating compliance pursuant to sub. (4)(b)5 c 2), the value of H_v determined using Equation (4) pursuant to sub. (4)(a)2 prior to modification or reconstruction.

5. All 3-hour periods, during actual coating operations, during which the average exhaust temperature is 5 or more Celsius degrees above the average temperature measured during the most recent performance test that demonstrated compliance for those affected facilities monitoring condenser exhaust gas temperature;

6. All 3-hour periods, during actual coating operations, during which the average combustion temperature is more than 28 Celsius degrees below the average combustion temperature during the most recent performance test that demonstrated compliance for those affected facilities monitoring thermal incinerator combustion gas temperature;

7. All 3-hour periods, during actual coating operations, during which the average gas temperature immediately before the catalyst bed is more than 28 Celsius degrees below the average gas temperature during the most recent performance test that demonstrated compliance and all 3-hour periods, during actual coating operations, during which the average gas temperature difference across the catalyst bed is less than 80% of the average gas temperature difference during the most recent performance test that demonstrated compliance for those affected facilities monitoring catalytic incinerator catalyst bed temperature; and

8. All 3-hour periods, during actual coating operations, during which the average total enclosure or VOC capture system monitoring device readings vary by 5% or more from the average value measured during the most recent performance test that demonstrated compliance for those affected facilities monitoring a total enclosure pursuant to sub. (5)(h) for VOC capture system pursuant to sub. (5)(g).

(e) Each owner or operator of an affected coating operation or affected coating mix preparation equipment subject to sub. (3)(e), not required to submit reports under par. (d) because no reportable periods have occurred shall submit semiannual reports so affirming.

(f) Each owner or operator of affected coating mix preparation equipment that is constructed at a time when no affected coating operation is being constructed shall:

1. Be exempt from the reporting requirements specified in s. NR 440.07(1)(a), (b) and (d); and

2. Submit the notification of actual startup specified in s. NR 440.07(1)(c).

(g) The owner or operator of affected coating mix preparation equipment that is constructed at the same time as an affected coating operation shall include the affected coating mix preparation equipment in all the reporting requirements for the affected coating operation specified in s. NR 440.07(1)(a) to (d).

(h) The reports required under pars. (b) to (e) shall be postmarked within 30 days of the end of the reporting period.

SECTION 185. NR 440.72(2)(a)1.a. and 4. are amended to read:

NR 440.72(2)(a)1.a. Products classified as typewriters under SIC ~~Code~~ code 3572 in the Standard Industrial Classification Manual, incorporated by reference in s. NR 440.17;

4. "Color coat" means the coat applied to a part that affects the color and gloss of the part, not including the prime coat or texture coat. This definition includes fog coating, but does not include conductive sensitizers or electromagnetic interference/radio frequency interference (EMI/RFI) shielding coatings.

SECTION 186. NR 440.72(2)(a)6. to 10. are renumbered 440.72(2)(a)7. to 11.

SECTION 187. NR 440.72(2)(a)6. is created to read:

NR 440.72(2)(a)6. "Electromagnetic interference/radio frequency interference (EMI/RFI) shielding coating" means a conductive coating that is applied to a plastic substrate to attenuate EMI/RFI signals.

SECTION 188. NR 440.72(2)(a)11. and 12. are renumbered NR 440.72(2)(a)12. and 13. and as renumbered are amended to read:

NR 440.72(2)(a)12. "Texture coat" means the rough coat that is characterized by discrete, raised spots on the exterior surface of the part. This definition does not include conductive sensitizers or EMI/RFI shielded coatings.

13. "Touch-up coat" means the coat applied to correct any imperfections in the finish after color or texture coats have been applied. This definition does not include conductive sensitizers or EMI/RFI shielded coatings.

SECTION 189. NR 440.72(2)(a)13. and 14. are renumbered 440.72(2)(a)14. and 15.

SECTION 190. NR 440.72(5)(d) is amended to read:

NR 440.72(5)(d) Each owner or operator subject to the provisions of this section shall maintain at the source, for a period of at least 2 years, records of all data and calculations used to determine monthly VOC emissions from each coating operation for each affected facility as specified in s. NR ~~440.07(4)~~ 440.07(5).

SECTION 191. NR 440.74 is created to read:

NR 440.74 POLYMERIC COATING OF SUPPORTING SUBSTRATES FACILITIES. (1) APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY. (a) The affected facility to which the provisions of this section apply is each coating operation and any onsite coating mix preparation equipment used to prepare coatings for the polymeric coating of supporting substrates.

(b) Any affected facility for which the amount of VOC used is less than 95 Mg per 12-month period is subject only to the requirements of subs. (5)(b), (8)(b) and (c). If the amount of VOC used is 95 Mg or greater per 12-month period, the facility is subject to all the requirements of this section. Once a facility has become subject to the requirements of this section it will remain subject to those requirements regardless of changes in annual VOC use.

(c) This section applies to any affected facility for which construction, modification or reconstruction begins after April 30, 1987, except for the facilities specified in par. (d).

(d) This section does not apply to the following:

1. Coating mix preparation equipment used to manufacture coatings at one plant for shipment to another plant for use in an affected facility or for sale to another company for use in an affected facility;

2. Coating mix preparation equipment or coating operations during those times they are used to prepare or apply waterborne coatings so long as the VOC content of the coating does not exceed 9% by weight of the volatile fraction;

3. Web coating operations that print an image on the surface of the substrate or any coating applied on the same printing line that applies the image.

(2) DEFINITIONS, SYMBOLS AND CROSS-REFERENCE TABLES. (a) All terms used in this section not defined as follows have the meaning given to them in s. NR 440.02.

1. "Coating applicator" means any apparatus used to apply a coating to a continuous substrate.

2. "Coating mix preparation equipment" means all mixing vessels in which solvent and mixing vessels in which solvent and other materials are blended to prepare polymeric coatings.

3. "Coating operation" means any coating applicators, flashoff areas and drying ovens located between a substrate unwind station and a rewind station that coats a continuous web to produce a substrate with a polymeric coating. If the coating process does not employ a rewind station, the end of the coating operation is after the last drying oven in the process.

4. "Common emission control device" means a device controlling emissions from an affected coating operation as well as from any other emission source.

5. "Concurrent" means the period of time in which construction of an emission control device serving an affected facility is commenced or completed, beginning 6 months prior to the date that construction of the affected facility commences and ending 2 years after the date that construction of the affected facility is completed.

6. "Control device" means any apparatus that reduces the quantity of a pollutant emitted to the air.

7. "Cover" means, with respect to coating mix preparation equipment, a device that fits over the equipment opening to prevent emission of volatile organic compounds from escaping.

8. "Drying oven" means a chamber within which heat is used to dry a surface coating; drying may be the only process or one of multiple processes performed in the chamber.

9. "Equivalent diameter" means 4 times the area of an opening divided by its perimeter.

10. "Flashoff area" means the portion of a coating operation between the coating applicator and the drying oven where VOC begins to evaporate from the coated substrate.

11. "Natural draft opening" means any opening in a room, building or total enclosure that remains open during operation of the facility and that is not connected to a duct in which a fan is installed. The rate and direction of the natural draft across such an opening is a consequence of the difference in pressure on either side of the wall or barrier containing the opening.

12. "Nominal 1-month period" means a calendar month or, if established prior to the performance test in a statement submitted with notification of anticipated startup pursuant to s. NR 440.07(1)(b), a similar monthly time period, for example, 30-day month or accounting month.

13. "Onsite coating mix preparation equipment" means those pieces of coating mix preparation equipment located at the same plant as the coating operation they serve.

14. "Polymeric coating of supporting substrates" means a web coating process that applies elastomers, polymers or prepolymers to a supporting web other than paper plastic film, metallic foil or metal coil.

15. "Substrate" means the surface to which a coating is applied.

16. "Temporary enclosure" means a total enclosure that is constructed for the sole purpose of measuring the fugitive VOC emissions from an affected facility.

17. "Total enclosure" means a structure that is constructed around a source of emissions and operated so that all VOC emissions are collected and exhausted through a stack or duct. With a total enclosure, there will be no fugitive emission, only stack emissions. The drying oven itself may be part of the total enclosure.

18. "Vapor capture system" means any device or combination of devices designed to contain, collect and route solvent vapors released from the coating mix preparation equipment or coating operation.

19. "VOC in the applied coating" means the product of Method 24 VOC analyses or formulation data, if those data are demonstrated to be equivalent

to Method 24 results, and the total volume of coating fed to the coating applicator.

20. "VOC used" means the amount of VOC delivered to the coating mix preparation equipment of the affected facility, including any contained in premixed coatings or other coating ingredients prepared off the plant site, for the formulation of polymeric coatings to be applied to supporting substrates at the coating operation, plus any solvent added after initial formulation is complete, for example, dilution solvents added at the coating operation. If premixed coatings that require no mixing at the plant site are used, "VOC used" means the amount of VOC delivered to the coating applicators of the affected facility.

21. "Volatile organic compounds" or "VOC" means any organic compounds that participate in atmospheric photochemical reactions; or that are measured by a reference method, an equivalent method, an alternative method or that are determined by procedures specified under any section.

22. "Waterborne coating" means a coating which contains more than 5 weight percent water in its volatile fraction.

23. "Web coating" means the coating of products, such as fabric, paper, plastic film, metallic foil, metal coil, cord and yarn, that are flexible enough to be unrolled from a large roll; and coated as a continuous substrate by methods including, but not limited to, knife coating, roll coating, dip coating, impregnation, rotogravure and extrusion.

(b) The nomenclature used in this section has the following meanings:

1. "A_k" means the area of each natural draft opening (k) in a total enclosure, in square meters.

2. "C_{aj}" means the concentration of VOC in each gas stream (j) exiting the emission control device, in parts per million by volume.

3. "C_{bi}" means the concentration of VOC in each gas stream (i) entering the emission control device, in parts per million by volume.

4. "C_{di}" means the concentration of VOC in each gas stream (i) entering the emission control device from the affected coating operation, in parts per million by volume.

5. "C_{fk}" means the concentration of VOC in each uncontrolled gas stream (k) emitted directly to the atmosphere from the affected coating operation, in parts per million by volume.

6. "C_{gv}" means the concentration of VOC in the gas stream entering each individual carbon absorber vessel (v), in parts per million by volume. For purposes of calculating the efficiency of the individual absorber vessel, C_{gv}

may be measured in the carbon adsorption system's common inlet duct prior to the branching of individual inlet ducts.

7. "C_{hv}" means the concentration of VOC in the gas stream exiting each individual carbon absorber vessel (v), in parts per million by volume.

8. "E" means the control device efficiency achieved for the duration of the emission test, expressed as a fraction.

9. "F" means the VOC emission capture efficiency of the vapor capture system achieved for the duration of the emission test, expressed as a fraction.

10. "FV" means the average inward face velocity across all natural draft openings in a total enclosure, in meters per hour.

11. "H_v" means the individual carbon absorber vessel (v) efficiency achieved for the duration of the emission test, expressed as a fraction.

12. "H_{sys}" means the carbon adsorption system efficiency calculated when each absorber vessel has an individual exhaust stack.

13. "M_{ci}" means the total mass (kg) of each coating (i) applied to the substrate at an affected coating operation during a nominal 1-month period as determined from facility records.

14. "M_r" means the total mass (kg) of VOC recovered for a nominal 1-month period.

15. "Q_{aj}" means the volumetric flow rate of each gas stream (i) exiting the emission control device, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

16. "Q_{bi}" means the volumetric flow rate of each gas stream (i) entering the emission control device, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

17. "Q_{di}" means the volumetric flow rate of each gas stream (i) entering the emission control device from the affected coating operation, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

18. "Q_{fk}" means the volumetric flow rate of each uncontrolled gas stream (k) emitted directly to the atmosphere from the affected coating operation, in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

19. "Q_{gv}" means the volumetric flow rate of the gas stream entering each individual carbon adsorber vessel (v), in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration. For purposes of calculating the efficiency of the individual adsorber vessel, the value of Q_{gv} can be assumed to equal the value of Q_{gv} measured for that adsorber vessel.

20. "Q_{hv}" means the volumetric flow rate of the gas stream exiting each individual carbon adsorber vessel (v), in dry standard cubic meters per hour when Method 18 or 25 is used to measure VOC concentration or in standard cubic meters per hour (wet basis) when Method 25A is used to measure VOC concentration.

21. "$Q_{in\ i}$" means the volumetric flow rate of each gas stream (i) entering the total enclosure through a forced makeup air duct, in standard cubic meters per hour (wet basis).

22. "$Q_{out\ j}$" means the volumetric flow rate of each gas stream (j) exiting the total enclosure through an exhaust duct or hood, in standard cubic meters per hour (wet basis).

23. "R" means the overall VOC emission reduction achieved for the duration of the emission test, expressed as a fraction.

24. "RS_i" means the total mass (kg) of VOC retained on the coated substrate after oven drying or contained in waste coating for a given combination of coating and substrate.

25. "W_{oi}" means the weight fraction of VOC in each coating (i) applied at an affected coating operation during a nominal 1-month period as determined by Method 24.

(c) Tables 1A and 1B present a cross reference of the affected facility status and the relevant subsections of the regulation.

Table 1A — CROSS REFERENCE[a]

Status	Standard	Compliance provisions - sub. (4)[b]
A. Coating operation:		
1. If projected VOC use is <95 Mg/yr	sub. (1)(b): Monitor VOC use..	Not applicable
2. If projected VOC use is >95 Mg/yr	sub. (3)(b)1: Reduce VOC emissions to the atmosphere from the coating operation by at least 90% or: sub. (3)(b)2: Install, operate and maintain a total enclosure around the coating operation and vent the captured VOC emissions from the total enclosure to a control device that is at least 95% efficient.	(a)1, (a)2, (a)3 or (a)4, (b), (e).
B. Coating mix preparation equipment:		
1. If projected VOC use is > 95 MG/yr but < 130 MG/yr.	sub. (3)(c)3: a. Install, operate and maintain a cover on each piece of affected equipment; or b. install operate and maintain a cover on each piece of affected equipment and vent VOC emissions to a VOC control device.	(d), (e).
2. If projected VOC use is > 130 Mg/yr but there is no concurrent construction of a control device.	sub. (3)(c)2: a. Install, operate and maintain a cover on each piece of affected equipment; or b. install operate and maintain a cover on each piece of affected equipment and vent VOC emissions to a VOC control device.	(d).
3. If projected VOC use is > 130 Mg/yr and there is concurrent construction of a control device.	sub. (3)(c)1: Install, operate and maintain a cover on each piece of affected equipment and vent VOC emissions from the covered equipment to a 95% efficient control device while preparation of the coating is taking place within the vessel.	(c), (e).

[a] This table is presented for the convenience of the user and is not intended to supersede the language of the regulation. For the details of the requirements, refer to the text of the regulation.

[b] Refer to Table 1B to determine which paragraphs of sub. (5), (6) and (8) correspond to each compliance provision (sub. (4)).

TABLE 1B — CROSS REFERENCE

Compliance Provisions - sub. (4)	Test methods-sub. (6)	Category/equipment[a]	Monitoring requirements-sub. (5)	Reporting and recordkeeping requirements - sub. (8)
A. Coating Operation (a)1. - Gaseous emission test for coating operations not using carbon adsorption beds with individual exhausts.	(b)-(g)......	General, CA, CO, TI, CI, PE, TE.	(a), (i), (j), (k), (c)1, (d), (e), -(f), (g).	(a), (d)7, (f), (g), (h), (d)1, (d)2 a, (d)3, (d)4, (d)5, (d)6.
(a)2. - Gaseous emission test for coating operations using carbon adsorption beds with individual exhausts.	(b)-(g)......	General, CA, PE, TE..	(a), (i), (j), (k), (c)2, (g)......................	(a), (d)7, (f), (g), (h), (d)1 b, (d)2 b, (d)6.
(a)3. - Monthly liquid material balance - can be used only when a VOC recovery device controls only those emissions from one affected coating operation.	(a)..........	VOC recovery.........	(i), (k)..................	(e), (f), (g), (h)
(a)4. - Short-term (3 to 7 day) liquid material balance - may be used as an alternative to (a)3.	(a)..........	General, CA, CO, PE, TE.................	(a), (i), (j), (k), (c)1, (c)2, (d), (g).	(a), (d)7, (f), (g), (h), (d)1, (d)2, (d)3, (d)6.
(b) - Alternative standard for coating operation - demonstrate use of approved total enclosure and emissions vented to a 95% efficient control device.	(b)-(g).....	General, CA, CO, TI, CI, PE, TE.........	(a), (i), (j), (k), (c)1, (c)2, (d), (e), (f), (h).	(a), (d)7, (f), (g), (h), (d)1, (d)2, (d)3, (d)4, (d)5, (d)6.
B. Coating mix preparation equipment: (c) - Standard for equipment servicing a coating operation with concurrent construction of a control device that uses at least 130 Mg/yr of VOC - demonstrates that covers meeting specifications are installed and used properly; procedures detailing proper use are posted; the mix equipment is vented to a 95% efficient control device.	(b) - (g)	General, CA, TI, CI	(a), (i), (j), (k), (c)1, (c)2, (e), (f)	(a), (d)7, (f), (g), (h), (d)1, (d)2, (d)4, (d)5.
(d) - Standard for equipment servicing a coating operation that does not have concurrent construction of a control device but uses at least 130 Mg/yr of VOC or for equipment serving a coating operation that uses < 130 Mg/yr but > 95 Mg/yr of VOC - demonstrate that covers meeting specifications are installed and used properly; procedures detailing proper use are posted; the mix equipment is vented to a control device (optional).	No other require-ments apply.	——	——	——

[a] CA = carbon adsorber; CO = condenser; TI = thermal incinerator; CI = catalytic incinerator; PE = partial enclosure; TE = total enclosure

(3) STANDARDS FOR VOLATILE ORGANIC COMPOUNDS. (a) Each owner or operator of an affected facility that is subject to the requirements of this section shall comply with the emissions limitations in this subsection on and after the date on which the initial performance test required by s. NR 440.08 is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated or 180 days after initial startup, whichever dates comes first.

(b) For the coating operation, each owner or operator of an affected facility shall either:

1. Reduce VOC emissions to the atmosphere from the coating operation by at least 90% ("emission reduction" standard); or

2. Install, operate and maintain a total enclosure around the coating operation and vent the captured VOC emissions from the total enclosure to a control device that is at least 95% efficient (alternative standard).

(c) For the onsite coating mix preparation equipment of an affected facility, the owner or operator shall comply with the following requirements, as applicable:

1. For an affected facility that has concurrent construction of a control device and uses at least 130 Mg of VOC per 12-month period, the owner or operator shall install, operate and maintain a cover on each piece of affected coating mix preparation equipment and vent VOC emissions from the covered mix equipment to a 95% efficient control device while preparation of the coating is taking place within the vessel.

2. For an affected facility that does not have concurrent construction of a control device but uses at least 130 Mg of VOC per 12-month period, the owner or operator shall either:

a. Install, operate and maintain a cover on each piece of affected coating mix preparation equipment; or

b. Install, operate and maintain a cover on each piece of affected coating mix preparation equipment and vent VOC emissions to a VOC control device.

3. For an affected facility that uses at least 95 Mg but less than 130 Mg of VOC per 12-month period, the owner or operator shall either:

a. Install, operate and maintain a cover on each piece of affected coating mix preparation equipment; or

b. Install, operate and maintain a cover on each piece of affected coating mix preparation equipment and vent VOC emissions to a VOC control device.

(4) COMPLIANCE PROVISIONS. (a) To demonstrate compliance with the emission reduction standard for coating operations specified in sub. (3)(b)1, the owner or operator of the affected facility shall use one of the following methods.

1. For coating operations not using carbon adsorption beds with individual exhausts the following gaseous emission test method is applicable when the emissions from any affected coating operation are controlled by a control device other than a fixed-bed carbon adsorption system with individual

exhaust stacks for each adsorber vessel. The owner or operator using this method shall comply with the following procedures:

a. Construct the vapor capture system and control device so that all gaseous volumetric flow rates and total VOC emissions can be accurately determined by the applicable test methods and procedures specified in sub. (6)(b) to (g);

b. Determine capture efficiency from the coating operation by capturing, venting and measuring all VOC emissions from the coating operation. During a performance test, the owner or operator of an affected coating operation located in an area with other sources of VOC shall isolate the coating operation emissions from all other sources of VOC by one of the following methods:

1) Build a temporary enclosure, as defined in sub. (2)(a) and conforming to the requirements of par. (b)1, around the affected coating operation. The temporary enclosure shall be constructed and ventilated, through stacks suitable for testing, so that it has minimal impact on performance of the capture system; or

2) Shut down all other sources of VOC and continue to exhaust fugitive emissions from the affected coating operation through any building ventilation system and other room exhausts such as those on drying ovens. All such ventilation air shall be vented through stacks suitable for testing because the VOC content in each shall be determined.

c. Operate the emission control device with all emission sources connected and operating.

d. Determine the efficiency (E) of the control device by Equation 1:

$$E = \frac{\sum_{i=1}^{n} Q_{bi}C_{bi} - \sum_{j=1}^{n} Q_{aj}C_{aj}}{\sum_{i=1}^{n} Q_{bi}C_{bi}} \qquad \text{(Equation 1)}$$

e. Determine the efficiency (F) of the vapor capture system by Equation 2:

$$F = \frac{\sum_{i=1}^{n} Q_{di}C_{di}}{\sum_{i=1}^{n} Q_{di}C_{di} + \sum_{k=1}^{p} Q_{fk}C_{fk}} \qquad \text{(Equation 2)}$$

f. For each affected coating operation subject to sub. (3)(b)1 (emission reduction standard for coating operations), compliance is demonstrated if the product of (E) × (F) is equal to or greater than 0.90.

2. For coating operations using carbon adsorption beds with individual exhausts the following gaseous emission test method is applicable when emissions from any affected coating operation are controlled by a fixed-bed carbon adsorption system with individual exhaust stacks for each adsorber vessel. The owner or operator using this method shall comply with the following procedures:

a. Construct the vapor capture system and control device so that each volumetric flow rate and the total VOC emissions can be accurately determined by the applicable test methods and procedures specified in sub. (6)(b) to (g);

b. Assure that all VOC emissions from the coating operation are segregated from other VOC sources and that the emissions can be captured for measurement, as described in sub. (4)(a)1 b 1) and 2);

c. Operate the emission control device with all emission sources connected and operating;

d. Determine the efficiency (H_v) of each individual adsorber vessel (v) using Equation 3:

$$H_v = \frac{Q_{gv}C_{gv} - Q_{hv}C_{hv}}{Q_{gv}C_{gv}} \qquad \text{(Equation 3)}$$

e. Determine the efficiency of the carbon adsorption system (H_{sys}) by computing the average efficiency of the adsorber vessels as weighted by the volumetric flow rate (Q_{hv}) of each individual adsorber vessel (v) using Equation 4:

$$H_{sys} = \frac{\sum_{v=1}^{q} H_v Q_{hv}}{\sum_{v=1}^{q} Q_{hv}} \qquad \text{(Equation 4)}$$

f. Determine the efficiency (F) of the vapor capture system using Equation (2).

g. For each affected coating operation subject to sub. (3)(b)1 (emission reduction standard for coating operations), compliance is demonstrated if the product of $(H_{sys}) \times (F)$ is equal to or greater than 0.90.

3. The monthly liquid material balance method can be used only when a VOC recovery device controls only those emissions from one affected coating operation. It may not be used if the VOC recovery device controls emissions from any other VOC emission sources. When demonstrating compliance by this method, s. NR 440.08(6) does not apply. The owner or operator using this method shall comply with the following procedures to determine the VOC emission reduction for each nominal 1-month period:

a. Measure the amount of coating applied at the coating applicator. This quantity shall be determined at a time and location in the process after all ingredients, including any dilution solvent, have been added to the coating or appropriate adjustments shall be made to account for any ingredients added after the amount of coating has been determined:

b. Determine the VOC content of all coatings applied using the test method specified in sub. (6)(a). This value shall be determined at a time and location in the process after all ingredients, including any dilution solvent, have been added to the coating or appropriate adjustments shall be made to account for any ingredients added after the VOC content in the coating has been determined;

c. Install, calibrate, maintain and operate, according to the manufacturer's specifications, a device that indicates the cumulative amount of VOC recovered by the control device over each nominal 1-month period. The device shall be certified by the manufacturer to be accurate to within ±2.0%;

d. Measure the amount of VOC recovered; and

e. Calculate the overall VOC emission reduction (R) for each and every nominal 1-month period using Equation 5. Emissions during startups and shutdowns are to be included when determining R because startups and shutdowns are part of normal operation for this source category.

$$R = \frac{M_r}{\sum_{i=1}^{n} (W_{oi} M_{ci} - RS_i)} \qquad \text{(Equation 5)}$$

If the value of R is equal to or greater than 0.90, compliance with sub. (3)(b)1 is demonstrated.

1) The value of RS_i is zero unless the owner or operator submits the following information to the administrator for approval of a measured value of RS_i, that is greater than zero but less than or equal to 6% by weight of the liquid VOC applied:

a) Measurement techniques; and

b) Documentation that the measured value of RS_i, exceeds zero but is less than or equal to 6% by weight of the liquid VOC applied.

2) For those facilities not subject to subpar. e 1), the value of RS_i is zero unless the owner or operator submits the following information to the administrator for approval of a measured value of RS_i that is greater than 6% by weight of the liquid VOC applied:

a) Measurement techniques;

b) Documentation that the measured value of RS_i exceeds 6% by weight of the liquid VOC applied; and

c) Either documentation of customer specifications requiring higher values or documentation that the desired properties of the product make necessary for RS_i to exceed 6% by weight of the liquid VOC applied and that such properties cannot be achieved by other means.

3) The measurement techniques of subpars. e 1)a) and e 2)a) shall be submitted to the department for approval with the notification of anticipated startup required under s. NR 440.07(1)(b).

f. The point at which M_r is to be measured shall be established when the compliance procedures are approved. The presumptive point of measurement shall be prior to separation/purification; a point after separation/purification may be adopted for enhanced convenience or accuracy.

4. Short-term liquid material balance. This method may be used as an alternative to the monthly liquid material balance described in subd. 3. The

owner or operator using this method shall comply with the following procedures to determine VOC emission reduction for a 3 to 7 day period and shall continuously monitor VOC emissions as specified in sub. (5).

a. Use the procedures described in subd. 3 a through f to determine the overall emission reduction, R. Compliance is demonstrated if the value of R is equal to or greater than 0.90.

b. The number of days for the performance test is to be based on the affected facility's representative performance consistent with the requirements of s. NR 440.08(3). Data demonstrating that the chosen test period is representative shall be submitted to the department for approval with the notification of anticipated startup required under s. NR 440.07(1)(b).

(b) Each owner or operator of an affected coating operation subject to the standard specified in sub. (3)(b)2 shall:

1. Demonstrate that a total enclosure is installed. The total enclosure shall either be approved by the department in accordance with the provisions of sub. (7) or meet the requirements in subpars. a to f as follows:

a. The only openings in the enclosure are forced makeup air and exhaust ducts and natural draft openings such as those through which raw materials enter and exit the coating operation;

b. Total area of all natural draft openings does not exceed 5% of the total surface are of the total enclosure's walls, floor and ceiling;

c. All access doors and windows are closed during normal operation of the enclosed coating operation, except for brief, occasional openings to accommodate process equipment adjustments. If openings are frequent or if the access door or window remains open for a significant amount of time during the process operation, it shall be considered a natural draft opening. Access doors used routinely by workers to enter and exit the enclosed area shall be equipped with automatic closure devices;

d. Average inward face velocity (FV) across all natural draft openings is a minimum of 3,600 meters per hour as determined by the following procedures:

1) Construct all forced makeup air ducts and all exhaust ducts so that the volumetric flow rate in each can be accurately determined by the test methods and procedures specified in sub. (6)(c) and (d). Volumetric flow rates shall be calculated without the adjustment normally made for moisture content; and

2) Determine FV by Equation 6:

$$FV = \frac{\sum_{j=1}^{n} Q_{out\ j} - \sum_{i=1}^{p} Q_{in\ i}}{\sum_{k=1}^{q} A_k} \qquad \text{(Equation 6)}$$

e. The air passing through all natural draft openings flows into the enclosure continuously. If FV is less than or equal to 9,000 meters per hour, the continuous inward airflow shall be verified by continuous observation using smoke tubes, streamers, tracer gases or other means approved by the department over the period that the volumetric flow rate tests required to determine FV are carried out. If FV is greater than 9,000 meters per hour, the direction of airflow through the natural draft openings shall be presumed to be inward at all times without verification.

f. All sources of emissions within the enclosure shall be a minimum of 4 equivalent diameters away from each natural draft opening.

2. Determine the control device efficiency using Equation (1) or Equations (3) and (4), as applicable and the test methods and procedures specified in sub. (6)(b) to (g).

3. Compliance is demonstrated if the installation of a total enclosure is demonstrated and the value of E determined from Equation (1) or the value of H_{sys} determined from Equations (3) and (4), as applicable, is equal to or greater than 0.95.

(c) To demonstrate compliance with sub. (3)(c)1, standard for coating mix preparation equipment servicing a coating operation with concurrent construction of a control device that uses at least 130 Mg per year of VOC, each owner or operator of affected coating mix preparation equipment shall demonstrate that:

1. Covers meeting the following specifications have been installed and are being used properly:

a. Cover shall be closed at all times except when adding ingredients, withdrawing samples, transferring the contents or making visual inspection when such activities cannot be carried out with cover in place. Activities shall be carried out through ports of the minimum practical size;

b. Cover shall extend at least 2 centimeters beyond the outer rim of the opening or shall be attached to the rim;

c. Cover shall be of such design and construction that contact is maintained between cover and rim along the entire perimeter;

d. Any breach in the cover, such as a slit for insertion of a mixer shaft or port for addition of ingredients, shall be covered consistent with subpars. a to c when not actively in use. An opening sufficient to allow safe clearance for a mixer shaft is acceptable during those periods when the shaft is in place; and

e. A polyethylene or nonpermanent cover may be used provided it meets the requirements of subpars. b to d. A cover may not be reused after once being removed.

2. Procedures detailing the proper use of covers, as specified in subd. 1 a, have been posted in all areas where affected coatings mix preparations equipment is used;

3. The coating mix preparation equipment is vented to a control device while preparation of the coating is taking place within the vessel; and

4. The control device efficiency, E or H_{sys}, as applicable, determined using Equation (1) or Equations (3) and (4), respectively and the test methods and procedures specified in sub. (6)(b) to (g) is equal to or greater than 0.95.

(d) To demonstrate compliance with sub. (3)(c)2, standard for coating mix preparation equipment servicing a coating operation that does not have concurrent construction of a control device but uses at least 130 Mg of VOC per year, or sub. (3)(c)3, standard for coating mix preparation equipment servicing a coating operation that uses at least 95 Mg but less than 130 Mg of VOC per year, each owner or operator of affected coating mix preparation equipment shall demonstrate upon inspection that:

1. Covers satisfying the specifications in par. (c)1 a to e have been installed and are being properly operated and maintained; and

2. Procedures detailing the proper use of covers, as specified in par. (c)1 a, have been posted in all areas where affected coating mix preparation equipment is used.

3. Owners or operators meeting the standard specified in sub. (3)(c)2 b or 3 b shall also demonstrate that the coating mix preparation equipment is vented to a control device.

(e) If a control device other than a carbon adsorber, condenser or incinerator is used to control emissions from an affected facility, the necessary operating specifications for that device shall be approved by the administrator. An example of such a device is a flare.

(5) MONITORING REQUIREMENTS (a) Each owner or operator of an affected facility shall install and calibrate all monitoring devices required under the provisions of this subsection according to the manufacturer's specifications, prior to the initial performance test in locations such that representative values of the monitored parameters will be obtained. The parameters to be monitored shall be continuously measured and recorded during each performance test.

(b) Each owner or operator of an affected facility that uses less that 95 Mg of VOC per year and each owner or operator of an affected facility subject to the provisions specified in sub. (3)(c)3 shall:

1. Make semiannual estimates of the projected annual amount of VOC to be used for the manufacture of polymeric coated substrate at the affected coating operation in that year; and

2. Maintain records of actual VOC use.

(c) Each owner or operator of an affected facility controlled by a carbon adsorption system and demonstrating compliance by the procedures described in sub. (3)(a)1, 2, (b) or (c), which include control device efficiency determinations, or sub. (4)(a)4, short-term liquid material balance, shall carry out the monitoring provisions of subd. 1 or 2, as appropriate.

1. For carbon adsorption systems with a common exhaust stack for all the individual adsorber vessels, install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the concentration level of organic compounds in either the control device outlet gas stream or in both the control device inlet and outlet gas streams. The outlet gas stream shall be monitored if the percent increase in the concentration level of organic compounds is used as the basis for reporting, as described in sub. (8)(d)1 a. The inlet and outlet gas streams shall be monitored if the percent control device efficiency is used as the basis for reporting, as described in sub. (8)(d)2 a.

2. For carbon adsorption systems with individual exhaust stacks for each adsorber vessel, install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the concentration level of organic compounds in the outlet gas stream for a minimum of one complete adsorption cycle per day for each

adsorber vessel. The owner or operator may also monitor and record the concentration level of organic compounds in the common carbon adsorption system inlet gas stream or in each individual carbon adsorber vessel inlet stream. The outlet gas streams shall be monitored if the percent increase in the concentration level of organic compounds is used as the basis for reporting, as described in sub. (8)(d)1 b. In this case, the owner or operator shall compute daily a 3-day rolling average concentration level of organics in the outlet gas stream from each individual adsorber vessel. The inlet and outlet gas streams shall be monitored if the percent control device efficiency is used as the basis for reporting, as described in sub. (8)(d)2 b. In this case, the owner or operator shall compute daily a 3-day rolling average efficiency for each individual adsorber vessel.

(d) Each owner or operator of an affected facility controlled by a condensation system and demonstrating compliance by the test methods described in sub. (4)(a)1, 2, (b) or (c), which include control device efficiency determinations, or sub. (4)(a)4, short-term liquid material balance, shall install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the temperature of the condenser exhaust stream.

(e) Each owner or operator of an affected facility controlled by a thermal incinerator and demonstrating compliance by the test methods described in sub. (4)(a)1, 2, (b) or (c), which include control device efficiency determinations, shall install, calibrate maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the combustion temperature of the incinerator. The monitoring device shall have an accuracy within ±1% of the temperature being measured in Celsius degrees.

(f) Each owner or operator of an affected facility controlled by a catalytic incinerator and demonstrating compliance by the test methods described in sub. (4)(a)1, 2, (b) or (c), which include control device efficiency determinations, shall install, calibrate maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the gas temperature both upstream and downstream of the catalyst bed. The monitoring device shall have an accuracy within ±1% of the temperature being measured in Celsius degrees.

(g) Each owner or operator of an affected facility who demonstrates compliance by the test methods described in sub. (4)(a)1 or 2, which include vapor capture system efficiency determinations, or sub. (4)(a)4, short-term liquid material balance, shall submit a monitoring plan for the vapor capture system to the department for approval with the notification of anticipated startup required under s. NR 440.07(1)(b). This plan shall identify the parameter to be monitored as an indicator of vapor capture system performance, for example, the amperage to the exhaust fans or duct flow rates, and the method for monitoring the chosen parameter. The owner or operator shall install, calibrate, maintain and operate, according to the manufacturer's specifications, a monitoring device that continuously indicates and records the value of the chosen parameter.

(h) Each owner or operator of an affected facility who demonstrates compliance as described in sub. (4)(b) shall follow the procedures described in par. (g) to establish a monitoring system for the total enclosure.

(i) Each owner or operator of an affected facility shall record time periods of mixing or coating operations when the emission control device is malfunctioning or not in use.

(j) Each owner or operator of an affected facility shall record time periods of mixing or coating operations when each monitoring device is malfunctioning or not in use.

(k) Records of the measurements and calculations required in subs. (4) and (5) shall be retained for at least 2 years following the date of the measurements and calculations.

(6) TEST METHODS AND PROCEDURES. Methods in Appendix A of 40 CFR part 60, incorporated by reference in s. NR 440.17, except as provided under s. NR 440.08(2), shall be used to determine compliance as follows:

(a) Method 24 is used to determine the VOC content in coatings. If it is demonstrated to the satisfaction of the administrator that coating formulation data are equivalent to Method 24 results, formulation data may be used. In the event of any inconsistency between a Method 24 test and a facility's formulation data, the Method 24 test will govern. For Method 24, the coating sample shall be a 1-liter sample collected in a 1-liter container at a point in the process where the sample will be representative of the coating applied to the substrate, that is, the sample shall include any dilution solvent or other VOC added during the manufacturing process. The container shall be tightly sealed immediately after the sample is collected. Any solvent or other VOC added after the sample is taken shall be measured and accounted for in the calculations that use Method 24 results.

(b) Method 25 shall be used to determine VOC concentrations from incinerator gas streams. Alternative Methods (18 or 25A), may be used as explained in the applicability section of Method 25 in cases where use of Method 25 is demonstrated to be technically infeasible. The owner or operator shall submit notice of the intended test method to the department for approval along with the notification of the performance test required under s. NR 440.08(4). Except as indicated in subds. 1 and 2, the test shall consist of 3 separate runs, each lasting a minimum of 30 minutes.

1. When the method is to be used in the determination of the efficiency of a fixed-bed carbon adsorption system with a common exhaust stack for all the individual adsorber vessels pursuant to sub. (4)(a)1, (b) or (c), the test shall consist of 3 separate runs, each coinciding with one or more complete system rotations through the adsorption cycles of all the individual adsorber vessels.

2. When the method is to be used in the determination of the efficiency of a fixed-bed carbon adsorption system with individual exhaust stacks for each adsorber vessel pursuant to sub. (4)(a)2, (b) or (c), each adsorber vessel shall be tested individually. Each test shall consist of 3 separate runs, each coinciding with one or more complete adsorption cycles.

(c) Method 1 or 1A is used for sample and velocity traverses;

(d) Method 2, 2A, 2C or 2D is used for velocity and volumetric flow rates;

(e) Method 3 is used for gas analysis;

(f) Method 4 is used for stack gas moisture;

(g) Methods 2, 2A 2C or 2D; 3; and 4 shall be performed as applicable at least twice during each test run.

Note: Under 40 CFR s. 60.746, if, in the administrator's judgment, an alternative means of emission limitation will achieve a reduction in emissions of VOC from any emission point subject to sub. (3)(c) at least equivalent to that required by sub. (3)(b)2 or (3)(c), respectively, the administrator will publish in the Federal Register a notice permitting the use of the alternative means. The administrator may condition permission on requirements that may be necessary to ensure operation and maintenance to achieve the emission reduction as specified in sub. (3)(b)2 or (3)(c), respectively. Any such notice shall be published only after public notice and an opportunity for a public hearing. Any person seeking permission under 40 CFR s. 60.746 shall submit to the administrator either results from an emission test that accurately collects and measures all VOC emissions from a given control device or an engineering evaluation that accurately determines such emissions.

(8) REPORTING AND RECORDKEEPING REQUIREMENTS. (a) For each affected facility subject to the requirements of sub. (3)(b) and (c), the owner or operator shall submit the performance test data and results to the department as specified in s. NR 440.08(1). In addition, the average values of the monitored parameters measured at least every 15 minutes and averaged over the period of the performance test shall be submitted with the results of all performance tests.

(b) Each owner or operator of an affected facility subject to the provisions specified in sub. (3)(c)3 and claiming to use less than 130 Mg of VOC in the first year of operation and each owner or operator of an affected facility claiming to use less than 95 Mg of VOC in the first year of operation shall submit to the department, with the notification of anticipated startup required under s. NR 440.07(1)(b), a material flow chart indicating projected VOC use. The owner or operator shall also submit actual VOC use records at the end of the initial year.

(c) Each owner or operator of an affected facility subject to the provisions of sub. (3)(c)3 and initially using less that 130 Mg of VOC per year and each owner or operator of an affected facility initially using less than 95 Mg of VOC per year shall:

1. Record semiannual estimates of projected VOC use and actual 12-month VOC use;

2. Report the first semiannual estimate in which projected annual VOC use exceeds the applicable cutoff; and

3. Report the first 12-month period in which the actual VOC use exceeds the applicable cutoff.

(d) Each owner or operator of an affected facility demonstrating compliance by the methods described in sub. (4)(a)1, 2, 4, (b) or (c) shall maintain records and submit quarterly reports to the department documenting the following:

1. For those affected facilities monitoring only the carbon adsorption system outlet concentration levels of organic compounds, the periods, during actual coating operations, specified in subpar. 1 a or b, as applicable.

a. For carbon adsorption systems with a common exhaust stack for all the individual adsorber vessels, all periods of 3 consecutive system rotations through the adsorption cycles of all the individual adsorber vessels during which the average value of the concentration level of organic compounds in the common outlet gas stream is more the 20% greater than the average value measured during the most recent performance test that demonstrated compliance.

b. For carbon adsorption systems with individual exhaust stacks for each adsorber vessel, all 3-day rolling averages for each adsorber vessel when the concentration level of organic compounds in the individual gas stream is more than 20% greater than the average value for that adsorber vessel measured during the most recent performance test that demonstrated compliance.

2. For those affected facilities monitoring both the carbon adsorption system inlet and outlet concentration levels of organic compounds, the periods, during actual coating operations, specified in subpar. a or b, as applicable.

a. For carbon adsorption systems with a common exhaust stack for all the individual adsorber vessels, all periods of 3 consecutive adsorption cycles of all the individual adsorber vessels during which the average carbon adsorption system efficiency falls below the applicable level as follows:

1) For those affected facilities demonstrating compliance by the performance test method described in sub. (4)(a)1, the value of E determined using Equation (1) during the most recent performance test that demonstrated compliance.

2) For those affected facilities demonstrating compliance by the performance test described in sub. (4)(a)4, the average value of the system efficiency measured with the monitor during the most recent performance test that demonstrated compliance.

3) For those affected facilities demonstrating compliance pursuant to sub. (4)(b) or (c), 0.95.

b. For carbon adsorption systems with individual exhaust stacks for each adsorber vessel, all 3-day rolling averages for each adsorber vessel during which the average carbon adsorber vessel efficiency falls below the applicable level as follows:

1) For those affected facilities demonstrating compliance by the performance test method described in sub. (4)(a)2, (b) or (c), the value of H_v determined using Equation (3) during the most recent performance test that demonstrated compliance.

2) For those affected facilities demonstrating compliance by the performance test described in sub. (4)(a)4, the average efficiency for that adsorber vessel measured with the monitor during the most recent performance test that demonstrated compliance.

3. For those affected facilities monitoring condenser exhaust gas temperature, all 3-hour periods, during actual coating operations, during which the average exhaust temperature is 5 or more Celsius degrees above the average temperature measured during the most recent performance test that demonstrated compliance;

4. For those affected facilities monitoring thermal incinerator combustion exhaust gas temperature, all 3-hour periods, during actual coating operations, during which the average combustion temperature of the device is more than 28 Celsius degrees below the average combustion temperature of the device during the most recent performance test that demonstrated compliance;

5. For those affected facilities monitoring catalytic incinerator catalyst bed temperature, all 3-hour periods, during actual coating operations, during which the average gas temperature immediately before the catalyst bed is more than 28 Celsius degrees below the average gas temperature during the most recent performance test that demonstrated compliance and all 3-hour periods, during actual coating operations, during which the average gas temperature difference across the catalyst bed is less than 80% of the average gas temperature difference during the most recent performance test that demonstrated compliance;

6. For each affected facility monitoring a total enclosure pursuant to sub. (5)(h) or vapor capture system pursuant to sub. (5)(g), all 3-hour periods, during actual coating operations, during which the average total enclosure or vapor capture system monitor readings vary by 5% or more from the average value measured during the most recent performance test that demonstrated compliance.

7. Each owner or operator of an affected coating operation not required to submit reports under subd. 1 to 6 because no reportable periods have occurred shall submit semiannual statements clarifying this fact.

(e) Each owner or operator of an affected coating operation, demonstrating compliance by the test methods described in sub. (4)(a)3, liquid-liquid material balance, shall submit the following:

1. For months of compliance, semiannual reports to the department stating that the affected coating operation was in compliance for each 1-month period; and

2. For months of noncompliance, quarterly reports to the department documenting the 1-month amount of VOC contained in the coatings, the 1-month amount of VOC recovered and the percent emission reduction for each month.

(f) Each owner or operator of an affected coating operation, either by itself or with associated coating mix preparation equipment, shall submit the following with the reports required under pars. (d) and (e):

1. All periods during actual mixing or coating operations when a required monitoring device, if any, was malfunctioning or not operating; and

2. All periods during actual mixing or coating operations when the control device was malfunctioning or not operating.

(g) The reports required under pars. (b) to (e) shall be postmarked within 30 days of the end of the reporting period.

(h) Records required in sub. (8) shall be retained for at least 2 years.

The foregoing rule was approved and adopted by the State of Wisconsin Natural Resources Board on August 20, 1992.

The rule shall take effect the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

Dated at Madison, Wisconsin February 23, 1993.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By George E. Meyer
George E. Meyer, Secretary

(SEAL)