

## Environmental Protection Agency

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APPENDIX A TO PART 76—PHASE I AFFECTED COAL-FIRED UTILITY UNITS WITH GROUP 1 OR CELL BURNER BOILERS

APPENDIX B TO PART 76—PROCEDURES AND METHODS FOR ESTIMATING COSTS OF NITROGEN OXIDES CONTROLS APPLIED TO GROUP 1, PHASE I BOILERS

AUTHORITY: 42 U.S.C. 7601 and 7651 *et seq.*

SOURCE: 60 FR 18761, Apr. 13, 1995, unless otherwise noted.

### §76.1 Applicability.

(a) Except as provided in paragraphs (b) through (d) of this section, the provisions apply to each coal-fired utility unit that is subject to an Acid Rain emissions limitation or reduction requirement for SO<sub>2</sub> under Phase I or Phase II pursuant to sections 404, 405, or 409 of the Act.

(b) The emission limitations for NO<sub>x</sub> under this part apply to each affected coal-fired utility unit subject to section 404(d) or 409(b) of the Act on the date the unit is required to meet the Acid Rain emissions reduction requirement for SO<sub>2</sub>.

(c) The provisions of this part apply to each coal-fired substitution unit or compensating unit, designated and approved as a Phase I unit pursuant to §72.41 or §72.43 of this chapter as follows:

(1) A coal-fired substitution unit that is designated in a substitution plan that is approved and active as of January 1, 1995 shall be treated as a Phase I coal-fired utility unit for purposes of this part. In the event the designation of such unit as a substitution unit is terminated after December 31, 1995, pursuant to §72.41 of this chapter and the unit is no longer required to meet Phase I SO<sub>2</sub> emissions limitations, the provisions of this part (including those

applicable in Phase I) will continue to apply.

(2) A coal-fired substitution unit that is designated in a substitution plan that is not approved or not active as of January 1, 1995, or a coal-fired compensating unit, shall be treated as a Phase II coal-fired utility unit for purposes of this part.

(d) The provisions of this part for Phase I units apply to each coal-fired transfer unit governed by a Phase I extension plan, approved pursuant to §72.42 of this chapter, on January 1, 1997. Notwithstanding the preceding sentence, a coal-fired transfer unit shall be subject to the Acid Rain emissions limitations for nitrogen oxides beginning on January 1, 1996 if, for that year, a transfer unit is allocated fewer Phase I extension reserve allowances than the maximum amount that the designated representative could have requested in accordance with §72.42(c)(5) of this chapter (as adjusted under §72.42(d) of this chapter) unless the transfer unit is the last unit allocated Phase I extension reserve allowances under the plan.

### §76.2 Definitions.

All terms used in this part shall have the meaning set forth in the Act, in §72.2 of this chapter, and in this section as follows:

*Alternative contemporaneous annual emission limitation* means the maximum allowable NO<sub>x</sub> emission rate (on a lb/mmBtu, annual average basis) assigned to an individual unit in a NO<sub>x</sub> emissions averaging plan pursuant to §76.10.

*Alternative technology* means a control technology for reducing NO<sub>x</sub> emissions that is outside the scope of the definition of low NO<sub>x</sub> burner technology. Alternative technology does not include overfire air as applied to wall-fired boilers or separated overfire air as applied to tangentially fired boilers.

*Approved clean coal technology demonstration project* means a project using funds appropriated under the Department of Energy's "Clean Coal Technology Demonstration Program," up to a total amount of \$2,500,000,000 for commercial demonstration of clean coal technology, or similar projects funded

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through appropriations for the Environmental Protection Agency. The Federal contribution for a qualifying project shall be at least 20 percent of the total cost of the demonstration project.

*Arch-fired boiler* means a dry bottom boiler with circular burners, or coal and air pipes, oriented downward and mounted on waterwalls that are at an angle significantly different from the horizontal axis and the vertical axis. This definition shall include only the following units: Holtwood unit 17, Hunlock unit 6, and Sunbury units 1A, 1B, 2A, and 2B. This definition shall exclude dry bottom turbo fired boilers.

*Cell burner boiler* means a wall-fired boiler that utilizes two or three circular burners combined into a single vertically oriented assembly that results in a compact, intense flame. Any low NO<sub>x</sub> retrofit of a cell burner boiler that reuses the existing cell burner, close-coupled wall opening configuration would not change the designation of the unit as a cell burner boiler.

*Coal-fired utility unit* means a utility unit in which the combustion of coal (or any coal-derived fuel) on a Btu basis exceeds 50.0 percent of its annual heat input during the following calendar year: for Phase I units, in calendar year 1990; and, for Phase II units, in calendar year 1995 or, for a Phase II unit that did not combust any fuel that resulted in the generation of electricity in calendar year 1995, in any calendar year during the period 1990-1995. For the purposes of this part, this definition shall apply notwithstanding the definition in §72.2 of this chapter.

*Combustion controls* means technology that minimizes NO<sub>x</sub> formation by staging fuel and combustion air flows in a boiler. This definition shall include low NO<sub>x</sub> burners, overfire air, or low NO<sub>x</sub> burners with overfire air.

*Cyclone boiler* means a boiler with one or more water-cooled horizontal cylindrical chambers in which coal combustion takes place. The horizontal cylindrical chamber(s) is (are) attached to the bottom of the furnace. One or more cylindrical chambers are arranged either on one furnace wall or on two opposed furnace walls. Gaseous combustion products exiting from the chamber(s) turn 90 degrees to go up through

the boiler while coal ash exits the bottom of the boiler as a molten slag.

*Demonstration period* means a period of time not less than 15 months, approved under §76.10, for demonstrating that the affected unit cannot meet the applicable emission limitation under §76.5, 76.6, or 76.7 and establishing the minimum NO<sub>x</sub> emission rate that the unit can achieve during long-term load dispatch operation.

*Dry bottom* means the boiler has a furnace bottom temperature below the ash melting point and the bottom ash is removed as a solid.

*Economizer* means the lowest temperature heat exchange section of a utility boiler where boiler feed water is heated by the flue gas.

*Flue gas* means the combustion products arising from the combustion of fossil fuel in a utility boiler.

*Group 1 boiler* means a tangentially fired boiler or a dry bottom wall-fired boiler (other than a unit applying cell burner technology).

*Group 2 boiler* means a wet bottom wall-fired boiler, a cyclone boiler, a boiler applying cell burner technology, a vertically fired boiler, an arch-fired boiler, or any other type of utility boiler (such as a fluidized bed or stoker boiler) that is not a Group 1 boiler.

*Low NO<sub>x</sub> burners and low NO<sub>x</sub> burner technology* means commercially available combustion modification NO<sub>x</sub> controls that minimize NO<sub>x</sub> formation by introducing coal and its associated combustion air into a boiler such that initial combustion occurs in a manner that promotes rapid coal devolatilization in a fuel-rich (i.e., oxygen deficient) environment and introduces additional air to achieve a final fuel-lean (i.e., oxygen rich) environment to complete the combustion process. This definition shall include the staging of any portion of the combustion air using air nozzles or registers located inside any waterwall hole that includes a burner. This definition shall exclude the staging of any portion of the combustion air using air nozzles or ports located outside any waterwall hole that includes a burner (commonly referred to as NO<sub>x</sub> ports or separated overfire air ports).

*Maximum Continuous Steam Flow at 100% of Load* means the maximum capacity of a boiler as reported in item 3 (Maximum Continuous Steam Flow at 100% Load in thousand pounds per hour), Section C (design parameters), Part III (boiler information) of the Department of Energy's Form EIA-767 for 1995.

*Non-plug-in combustion controls* means the replacement, in a cell burner boiler, of the portions of the waterwalls containing the cell burners by new portions of the waterwalls containing low NO<sub>x</sub> burners or low NO<sub>x</sub> burners with overfire air.

*Operating period* means a period of time of not less than three consecutive months and that occurs not more than one month prior to applying for an alternative emission limitation demonstration period under §76.10, during which the owner or operator of an affected unit that cannot meet the applicable emission limitation:

(1) Operates the installed NO<sub>x</sub> emission controls in accordance with primary vendor specifications and procedures, with the unit operating under normal conditions; and

(2) records and reports quality-assured continuous emission monitoring (CEM) and unit operating data according to the methods and procedures in part 75 of this chapter.

*Plug-in combustion controls* means the replacement, in a cell burner boiler, of existing cell burners by low NO<sub>x</sub> burners or low NO<sub>x</sub> burners with overfire air.

*Primary vendor* means the vendor of the NO<sub>x</sub> emission control system who has primary responsibility for providing the equipment, service, and technical expertise necessary for detailed design, installation, and operation of the controls, including process data, mechanical drawings, operating manuals, or any combination thereof.

*Reburning* means reducing the coal and combustion air to the main burners and injecting a reburn fuel (such as gas or oil) to create a fuel-rich secondary combustion zone above the main burner zone and final combustion air to create a fuel-lean burnout zone. The formation of NO<sub>x</sub> is inhibited in the main burner zone due to the reduced combustion intensity, and NO<sub>x</sub> is

destroyed in the fuel-rich secondary combustion zone by conversion to molecular nitrogen.

*Selective catalytic reduction* means a noncombustion control technology that destroys NO<sub>x</sub> by injecting a reducing agent (e.g., ammonia) into the flue gas that, in the presence of a catalyst (e.g., vanadium, titanium, or zeolite), converts NO<sub>x</sub> into molecular nitrogen and water.

*Selective noncatalytic reduction* means a noncombustion control technology that destroys NO<sub>x</sub> by injecting a reducing agent (e.g., ammonia, urea, or cyanuric acid) into the flue gas, downstream of the combustion zone that converts NO<sub>x</sub> to molecular nitrogen, water, and when urea or cyanuric acid are used, to carbon dioxide (CO<sub>2</sub>).

*Stoker boiler* means a boiler that burns solid fuel in a bed, on a stationary or moving grate, that is located at the bottom of the furnace.

*Tangentially fired boiler* means a boiler that has coal and air nozzles mounted in each corner of the furnace where the vertical furnace walls meet. Both pulverized coal and air are directed from the furnace corners along a line tangential to a circle lying in a horizontal plane of the furnace.

*Turbo-fired boiler* means a pulverized coal, wall-fired boiler with burners arranged on walls so that the individual flames extend down toward the furnace bottom and then turn back up through the center of the furnace.

*Vertically fired boiler* means a dry bottom boiler with circular burners, or coal and air pipes, oriented downward and mounted on waterwalls that are horizontal or at an angle. This definition shall include dry bottom roof-fired boilers and dry bottom top-fired boilers, and shall exclude dry bottom arch-fired boilers and dry bottom turbo-fired boilers.

*Wall-fired boiler* means a boiler that has pulverized coal burners arranged on the walls of the furnace. The burners have discrete, individual flames that extend perpendicularly into the furnace area.

*Wet bottom* means that the ash is removed from the furnace in a molten state. The term "wet bottom boiler" shall include: wet bottom wall-fired boilers, including wet bottom turbo-

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fired boilers; and wet bottom boilers otherwise meeting the definition of vertically fired boilers, including wet bottom arch-fired boilers, wet bottom roof-fired boilers, and wet bottom top-fired boilers. The term "wet bottom boiler" shall exclude cyclone boilers and tangentially fired boilers.

[60 FR 18761, Apr. 13, 1995, as amended at 61 FR 67162, Dec. 19, 1996]

#### § 76.3 General Acid Rain Program provisions.

The following provisions of part 72 of this chapter shall apply to this part:

- (a) § 72.2 (Definitions);
- (b) § 72.3 (Measurements, abbreviations, and acronyms);
- (c) § 72.4 (Federal authority);
- (d) § 72.5 (State authority);
- (e) § 72.6 (Applicability);
- (f) § 72.7 (New unit exemption);
- (g) § 72.8 (Retired units exemption);
- (h) § 72.9 (Standard requirements);
- (i) § 72.10 (Availability of information); and
- (j) § 72.11 (Computation of time).

In addition, the procedures for appeals of decisions of the Administrator under this part are contained in part 78 of this chapter.

#### § 76.4 Incorporation by reference.

(a) The materials listed in this section are incorporated by reference in the sections noted. These incorporations by reference (IBR's) were approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated as they existed on the date of approval, and notice of any change in these materials will be published in the FEDERAL REGISTER. The materials are available for purchase at the corresponding address noted below and are available for inspection at the Office of the Federal Register, 800 North Capitol St., NW., 7th Floor, Suite 700, Washington, DC, at the Public Information Reference Unit, U.S. EPA, 401 M St., SW., Washington, DC, and at the Library (MD-35), U.S. EPA, Research Triangle Park, North Carolina.

(b) The following materials are available for purchase from at least one of the following addresses: American So-

ciety for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, Pennsylvania 19103; or the University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan 48106.

(1) ASTM D 3176-89, Standard Practice for Ultimate Analysis of Coal and Coke, IBR approved May 23, 1995 for § 76.15.

(2) ASTM D 3172-89, Standard Practice for Proximate Analysis of Coal and Coke, IBR approved May 23, 1995 for § 76.15.

(c) The following material is available for purchase from the American Society of Mechanical Engineers (ASME), 22 Law Drive, Box 2350, Fairfield, NJ 07007-2350.

(1) ASME Performance Test Code 4.2 (1991), Test Code for Coal Pulverizers, IBR approved May 23, 1995 for § 76.15.

(2) [Reserved]

(d) The following material is available for purchase from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036 or from the International Organization for Standardization (ISO), Case Postale 56, CH-1211 Geneve 20, Switzerland.

(1) ISO 9931 (December, 1991) "Coal—Sampling of Pulverized Coal Conveyed by Gases in Direct Fired Coal Systems," IBR approved May 23, 1995 for § 76.15.

(2) [Reserved]

#### § 76.5 NO<sub>x</sub> emission limitations for Group 1 boilers.

(a) Beginning January 1, 1996, or for a unit subject to section 404(d) of the Act, the date on which the unit is required to meet Acid Rain emission reduction requirements for SO<sub>2</sub>, the owner or operator of a Phase I coal-fired utility unit with a tangentially fired boiler or a dry bottom wall-fired boiler (other than units applying cell burner technology) shall not discharge, or allow to be discharged, emissions of NO<sub>x</sub> to the atmosphere in excess of the following limits, except as provided in paragraphs (c) or (e) of this section or in § 76.10, 76.11, or 76.12:

(1) 0.45 lb/mmBtu of heat input on an annual average basis for tangentially fired boilers.

(2) 0.50 lb/mmBtu of heat input on an annual average basis for dry bottom