APPENDIX B TO PART 76—PROcedures AND METHODS FOR ESTIMATING COSTS OF NitROGEN oxides CONtROLS APPLIED TO GROUP 1, BoILERS

1. PURPOSE AND APPLICABILITY

This technical appendix specifies the procedures, methods, and data that the Administrator will use in establishing "*the degree of reduction achievable through this retrofit application of the best system of continuous emission reduction, taking into account available technology, costs, and energy and environmental impacts; and which is comparable to the costs of nitrogen oxides controls set pursuant to subsection (b)(1) of section 407 of the Act." In developing the allowable NOX emissions limitations for Group 1 boilers pursuant to subsection (b)(2) of section 407 of the Act, the Administrator will consider only those systems of continuous emission reduction that, when applied on a retrofit basis, are comparable in cost to the capital cost in constant dollars of low NOX retrofits application: (1) For the burner portion—burners or air and coal nozzles, burner throat and windbox modifications, and ductwork; and, where applicable, (2) for the combustion air staging portion—waterwall modifications or panels, windbox modifications, and ductwork; and (3) scope adders or supplemental equipment such as replacement or additional fans, dampers, or ignitors necessary for the proper operation of the low NOX burner technology. The Administrator will use in establishing "*the degree of reduction achievable through this retrofit application of the best system of continuous emission reduction, taking into account available technology, costs, and energy and environmental impacts; and which is comparable to the costs of nitrogen oxides controls set pursuant to subsection (b)(1) of section 407 of the Act." In developing the allowable NOX emissions limitations for Group 1 boilers pursuant to subsection (b)(2) of section 407 of the Act, the Administrator will consider only those systems of continuous emission reduction that, when applied on a retrofit basis, are comparable in cost to the capital cost in constant dollars of low NOX burner technology applied to Group 1, Phase 1 boilers.

The Administrator will evaluate the capital cost (in dollars per kilowatt electrical ($/kW)), the operating and maintenance costs (in $/year), and the cost-effectiveness (in annualized $/ton NOX removed) of installed low NOX burner technology controls over a range of boiler sizes (as measured by the gross electrical capacity of the associated generator in megawatt electrical (MW)) and utilization rates (in percent gross nameplate capacity on an annual basis) to develop estimates of the capital costs and cost effectiveness for Group 1, Phase 1 boilers. The following units will be excluded from these determinations of the capital costs and cost effectiveness of NOX controls set pursuant to subsection (b)(1) of section 407 of the Act: (1) Units employing an alternative technology, or otherwise as applied to wall-fired boilers or separated prefire air as applied to tangentially fired boilers, in lieu of low NOX burner technology for reducing NOX emissions; (2) units employing no controls, only controls installed before November 15, 1990, or only modifications to boiler operating parameters (e.g., burners out of service or fuel switching) for reducing NOX emissions; and (3) units that have not achieved the applicable emission limitation.

2. AVERAGE CAPITAL COST FOR LOW NOX BURNER TECHNOLOGY APPLIED TO GROUP 1 BOILERS

The Administrator will use the procedures, methods, and data specified in this section to estimate the average capital cost (in $/kW) of installed low NOX burner technology applied to Group 1 boilers.

2.1 Using cost data submitted pursuant to the reporting requirements in section 4 below, boiler-specific actual or estimated actual capital costs will be determined for each unit in the population specified in section 1 above for assessing the costs of installed low NOX burner technology. The scope of installed low NOX burner technology costs will include the following capital costs for retrofit application: (1) For the burner portion—burners or air and coal nozzles, burner throat and waterwall modifications, and windbox modifications; and, where applicable, (2) for the combustion air staging portion—waterwall modifications or panels, windbox modifications, and ductwork; and (3) scope adders or supplemental equipment such as replacement or additional fans, dampers, or ignitors necessary for the proper operation of the low NOX burner technology. Capital costs associated with boiler restoration or refurbishment such as replacement of air heaters, asbestos abatement, and resurfacing will not be included in the cost basis for installed low NOX burner technology. The scope of installed low NOX burner technology retrofit capital costs will include materials, construction and installation labor, engineering, and overhead costs.

2.2 Using gross nameplate capacity (in MW) for each unit as reported in the National Allowance Data Base (NADB), boiler-specific capital costs will be converted to a $/kW basis.

2.3 Capital cost curves ($/kW versus boiler size in MW) or equations for installed low NOX burner technology retrofit costs will be developed for: (1) Dry bottom wall fired boilers (excluding units applying cell burner

---

APPENDIX

**Table 3—Phase I Cell Burner Technology Units—Continued**

<table>
<thead>
<tr>
<th>State</th>
<th>Plant</th>
<th>Unit</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHIO</td>
<td>MUSKINGUM RIVER</td>
<td>5</td>
<td>OHIO POWER CO.</td>
</tr>
<tr>
<td>OHIO</td>
<td>WH SAMMIS</td>
<td>6</td>
<td>OHIO EDISON CO.</td>
</tr>
<tr>
<td>PENNSYLVANIA</td>
<td>HATFIELDS FERRY</td>
<td>7</td>
<td>WEST PENN POWER CO.</td>
</tr>
<tr>
<td>PENNSYLVANIA</td>
<td>HATFIELDS FERRY</td>
<td>8</td>
<td>WEST PENN POWER CO.</td>
</tr>
<tr>
<td>TENNESSEE</td>
<td>CUMBERLAND</td>
<td>9</td>
<td>TENNESSEE VAL AUTH.</td>
</tr>
<tr>
<td>WEST VIRGINIA</td>
<td>FORT MARTIN</td>
<td>10</td>
<td>MONONGAHELA POWER CO.</td>
</tr>
</tbody>
</table>
technology) and (2) tangentially fired boilers.

3. [RESERVED]

4. REPORTING REQUIREMENTS

4.1 The following information is to be submitted by each designated representative of a Phase I affected unit subject to the reporting requirements of §76.14(c):

4.1.1 Schedule and dates for baseline testing, installation, and performance testing of low NO\textsubscript{X} burner technology.

4.1.2 Estimates of the annual average baseline NO\textsubscript{X} emission rate, as specified in section 3.1.1, and the annual average controlled NO\textsubscript{X} emission rate, as specified in section 3.1.2, including the supporting continuous emission monitoring or other test data.

4.1.3 Copies of pre-retrofit and post-retrofit performance test reports.

4.1.4 Detailed estimates of the capital costs based on actual contract bids for each component of the installed low NO\textsubscript{X} burner technology including the items listed in section 2.1. Provide a copy of the actual agreement for the installed technology.

4.1.5 Detailed estimates of the capital costs of system replacements or upgrades such as coal pipe changes, fan replacements/ upgrades, or mill replacements/upgrades undertaken as part of the low NO\textsubscript{X} burner technology retrofit project.

4.1.6 Detailed breakdown of the actual costs of the completed low NO\textsubscript{X} burner technology retrofit project where low NO\textsubscript{X} burner technology costs (section 4.1.4) are disaggregated, if feasible, from system replacement or upgrade costs (section 4.1.5).

4.1.7 Description of the probable causes for significant differences between actual and estimated low NO\textsubscript{X} burner technology retrofit project costs.

4.1.8 Detailed breakdown of the burner and, if applicable, combustion air staging system annual operating and maintenance costs for the items listed in section 3.3 before and after the installation, shakedown, and/or optimization of the installed low NO\textsubscript{X} burner technology. Include estimates and a description of the probable causes of the incremental annual operating and maintenance costs (or savings) attributable to the installed low NO\textsubscript{X} burner technology.

4.2 All capital cost estimates are to be broken down into materials costs, construction and installation labor costs, and engineering and overhead costs. All operating and maintenance costs are to be broken down into maintenance materials costs, maintenance labor costs, operating labor costs, and fan electricity costs. All capital and operating costs are to be reported in dollars with the year of expenditure or estimate specified for each component.


PART 77—EXCESS EMISSIONS

Sec. 77.1 Purpose and scope.
77.2 General.
77.3 Offset plans for excess emissions of sulfur dioxide.
77.4 Administrator’s action on proposed offset plans.
77.5 Deduction of allowances to offset excess emissions of sulfur dioxide.
77.6 Penalties for excess emissions of sulfur dioxide and nitrogen oxides.

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

SOURCE: 58 FR 3757, Jan. 11, 1993, unless otherwise noted.

§ 77.1 Purpose and scope.
(a) This part sets forth the excess emissions offset planning and offset penalty requirements under section 411 of the Clean Air Act, 42 U.S.C. 7401, et seq., as amended by Public Law 101–549 (November 15, 1990). These requirements shall apply to the owners and operators and, to the extent applicable, the designated representative of each affected unit and affected source under the Acid Rain Program.
(b) Nothing in this part shall limit or otherwise affect the application of sections 112(r)(9), 113, 114, 120, 303, 304, or 306 of the Act, as amended. Any allowance deduction, excess emission penalty, or interest required under this part shall not affect the liability of the affected unit’s and affected source’s owners and operators for any additional fine, penalty, or assessment, or their obligation to comply with any other remedy, for the same violation, as ordered under the Act.

§ 77.2 General.

Part 72 of this chapter, including §§72.2 (definitions), 72.3 (measurements, abbreviations, and acronyms), 72.4 (Federal authority), 72.5 (State authority), 72.6 (applicability), 72.7 (new units exemption), 72.8 (retired units exemption), 72.9 (standard requirements), 72.10 (availability of information), and 72.11 (computation of time), shall apply to this part. The procedures for appeals