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Clean Air: New Source Review Policies and Proposals

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Summary

On November 22, 2002, the Environmental Protection Agency (EPA) finalized revisions to several aspects of the Clean Air Act's (CAA) New Source Review (NSR) requirements. At the same time, EPA proposed rules to clarify the definition of "routine maintenance" under NSR. The proposed and final rules have generated controversy. The Bush Administration has argued that the new rules will reduce pollution and increase energy efficiency. In contrast, the State and Territorial Air Pollution Program Administrators (STAPPA) and Association of Local Air Pollution Control Officials (ALAPCO) argue that the revisions will "undermine efforts to achieve and sustain clean, healthful air." Nine Northeastern states filed suit against the final rules issued by EPA on December 31, 2002 in the U.S. Court of Appeals for the D.C. Circuit, and Pennsylvania filed a separate lawsuit on January 27, 2003; on January 30, eight states, mostly from the Midwest and the South, filed a petition in support of the final rule.

Into the 1970s, coal-fired electric generating facilities were built with a projected useful life of 30-40 years. Over time a powerplant's efficiency declined, until it would be replaced or put on standby for use during emergencies. As the CAA evolved, it established stringent pollution control requirements on newly constructed facilities, but not on older ones unless they underwent a modification that increases emissions (or emitted pollutants that exceeded health-based air quality standards). By the early 1980s, however, it became technically feasible to refurbish a powerplant to preserve its efficiency, so plants could continue in regular operation.

Thus, "life extension" became more advantageous than building new facilities that would incur capital and operating costs of CAA-required pollution controls. The crucial issue was whether life extension triggered the "modification" provision of the CAA: In promulgating regulations in 1975, EPA had exempted certain activities from the definition of modification, including "maintenance, repair, and replacement which the Administrator determines to be routine for a source category...." In response, utilities began to spread out their plant rehabilitation efforts in an attempt to fit them into their routine maintenance schedules.

If one believes that EPA's routine maintenance exemption was limited and did not permit the rehabilitation of existing facilities, then one would conclude that many of the industry's rehabilitation activities of the last 20 years go beyond what NSR allows. From this perspective, current law requires existing sources undergoing refurbishment to meet stringent NSR standards. This is the perspective underlying the Clinton Administration's enforcement initiative, an initiative for which the Bush Administration has stated its support. In contrast, if one believes that an exemption for routine maintenance is appropriate and should be defined in terms of current industry practices, then one would argue that NSR discourages plant owners from upgrading facilities operating with worn-out, inefficient components, thereby foregoing opportunities to conserve energy and to reduce emissions by installing newer, more efficient components. This perspective that NSR discourages energy efficiency is reflected in the Bush Administration's proposed revisions to routine maintenance published in December 2002. This report will not be updated.

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Background

On November 22, 2002, the Environmental Protection Agency (EPA) finalized revisions to several aspects of the Clean Air Act's (CAA) New Source Review (NSR) requirements. These revisions became effective with their publication in the *Federal Register* on December 31, 2002. At the same time, EPA proposed a rule to clarify the definition of "routine maintenance" under NSR. The proposed and final rules have generated controversy. The Bush Administration has argued that the new rules will reduce pollution and increase energy efficiency.¹ In contrast, the State and Territorial Air Pollution Program Administrators (STAPPA) and Association of Local Air Pollution Control Officials (ALAPCO) argue that the revisions will "undermine efforts to achieve and sustain clean, healthful air."² The attorneys general in nine Northeastern states filed suit against the final rules issued by EPA on December 31, 2002 in the U.S. Court of Appeals for the D.C. Circuit.³ Pennsylvania filed a separate lawsuit on January 27, 2003. On January 30, the attorneys general in eight states, mostly from the Midwest and the South filed a petition in support of the final rule.⁴

What Has Happened?

This is not the first time the NSR provisions of the Clean Air Act (CAA) have engendered controversy. Enacted as part of the 1977 CAA Amendments and modified in the 1990 CAA Amendments, NSR is designed to ensure that newly constructed facilities, or substantially modified existing facilities, do not result in violation of applicable air quality standards. NSR provisions outline permitting requirements both for construction of new major pollution sources and for modifications to existing major pollution sources. Specific requirements dictated by NSR depend on where the facility is sited. In attainment areas – those meeting the

¹Environmental Protection Agency, *New Source Review (NSR) Improvements*, November 21, 2002.

²STAPPA/ALAPCO, "EPA's New Source Review Reforms Will Undermine Environmental Protection, Say State/Local Air Pollution Control Agencies," November 22, 2002.

³They are: Connecticut, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. See: "Nine States Sue Bush Administration for Gutting Key Component of Clean Air Act," Press release, Department of Law, State of New York (December 31, 2002).

⁴They are: Indiana, Kansas, Nebraska, North Dakota, South Carolina, South Dakota, Utah, and Virginia.

National Ambient Air Quality Standard (NAAQS) for a pollutant – the governing requirements are the Prevention of Significant Deterioration (PSD) provisions of the CAA. In nonattainment areas – those not in compliance with a NAAQS for one or more pollutant – the governing requirements are covered by nonattainment provisions. Some facilities can be subject to a combination of both, if the area is in attainment for some criteria pollutants,⁵ but not others. Meeting these permitting requirements can be a long and complex process, depending on the specific project, the pollutants involved, and the specific state and federal regulatory authorities involved.⁶ In 1996, EPA proposed changes to NSR to streamline it.⁷ However, the proposals were subject to considerable controversy, and a final rule was not issued under the Clinton Administration. These complexities and controversies, particularly with respect to modifications of existing sources, became manifest in the November 1999 enforcement suits filed by the Justice Department for EPA, and in the responses to them.⁸

The Clinton Administration's enforcement initiative raised questions within the Bush Administration. In May 2001, Vice President Cheney's energy task force called on the Justice Department to review the legality of the lawsuits.⁹ In January 2002, the Justice Department found the lawsuits to be supported in law and fact.¹⁰ In addition, the energy task force asked EPA to review the impact of NSR on new utility and refinery generation capacity, energy efficiency, and environmental protection. In June 2002, EPA reported to the President that: (1) NSR had not significantly impeded investment in new power plants or refineries; (2) NSR had impeded projects at existing facilities that would maintain and improve reliability, efficiency and safety; and (3) NSR does result in significant environmental and public health

⁵ Pollutants for which EPA has set NAAQS are often called "criteria pollutants" after the criteria documents EPA prepares for setting the standard. For background on NAAQS and the criteria air pollutants and how the CAA is structured to ensure attainment of clean air, see *Clean Air Act: A Summary of the Act and Its Major Requirements*, CRS Report RL30853, pp. 3-8.

⁶ Many of the activities under the CAA, including many requirements specifically involving NSR, either reside with or can be and have been delegated to states (which can include territories, Indian tribal governments, and the District of Columbia). In essentially all cases, EPA can act in lieu of states to which authorities have not been delegated, or whenever states fail to take required actions.

⁷ 61 *Federal Register* 38249-38344, July 23, 1996.

⁸ Larry B. Parker and John E. Blodgett, *Air Quality and Electricity: Enforcing New Source Review*, CRS Report RL30432.

⁹ *Report of the National Energy Policy Development Group*, May 2001 (Chapter 7, p. 14)

¹⁰ United States Department of Justice, Office of Legal Policy, *New Source Review: An Analysis of the Consistency of Enforcement Actions with the Clean Air Act and Implementing Regulations*, January 2002, p. vi.

benefits.¹¹ Based on its findings, EPA recommended several revisions to NSR.¹² There were two parts to the recommendations. The first consisted of four recommendations that would complete the 1996 Clinton Administration's rulemaking process. The second was a recommendation to propose a regulation to clarify the definition of "routine maintenance."

As published in December 2002, the *final* rule's provisions fall into four categories based on EPA's June 2002 recommendations,¹³ and which the EPA believes completes the rulemaking process begun under the Clinton Administration in 1996¹⁴: (1) Plantwide Applicability Limits (PALs); (2) Clean Unit Exclusion; (3) Pollution Control and Prevention Projects; and (4) Emissions Calculation Test Methodology. Table 1 briefly summarizes the major differences between the regulations existing at the time of the rulemaking, the Clinton Administration's proposed rule; and EPA's 2002 final rule. EPA's final rule provides a detailed discussion of what it proposed in 1996 and what it finalized in November.¹⁵

The second rulemaking is a *proposed* clarification of the definition of routine maintenance.¹⁶ Moving away somewhat from its current "case-by-case" approach to determining routine maintenance, the revisions would carve out two categories of activities that would automatically constitute routine maintenance under NSR. The first category, "Annual Maintenance, Repair, and Replacement Allowance," would provide an exemption for safety, reliability, and efficiency activities whose capital and non-capital cost fall below a specific cost threshold. The second category, "Equipment Replacement Approach," would provide an exemption for replacing safety, reliability and efficiency rated components with new, functionally equivalent equipment if the cost of the replacement components is below a specific threshold. The proposal includes several options for implementing each of these approaches, and asks for comments on how the two approaches should interact and whether the second approach is sufficient alone.

¹¹ Environmental Protection Agency, *New Source Review: Report to the President* (June 2002), p. 1.

¹²U.S. Environmental Protection Agency, *EPA Announces Steps to Increase Energy Efficiency, Encourage Emissions Reductions* (June 2002).

¹³Some documents released by EPA refer to five "improvements" because they include in the Emissions Calculation Test Methodology category two improvements: (1) baseline change; and (2) test change.

¹⁴61 *Federal Register* 142 (July 23, 1996), pp. 38250-38344.

¹⁵67 *Federal Register* 80185-80314 (December 31, 2002). An internet version is available at: <http://www.epa.gov/nsr/nsrfinal.pdf>

¹⁶67 *Federal Register* 80290-80314 (December 31, 2002).

Table 1: NSR Final Rule: Summary of Major Provisions

Provision	Prior Existing Regulation	1996 Clinton Proposed Rule	2002 EPA Final Rule
Plantwide Applicability Limits	none	Voluntary emission cap based on most recent 2-yr. average plus a reasonable operating margin that is less than the trigger for NSR review. PALs may be adjusted to reflect any new requirements	Emission cap based on any consecutive 24-month period over the past 10 years and valid for 10 years
Clean Unit Exclusion	none	If unit meets a BACT or LAER limit set in the last 10 years, NSR would not be triggered by changes unless unit increases hourly potential emissions	If unit meets a BACT or LAER limit set since 1990, or MACT, RACT or undertook pollution prevention efforts, it would be excluded from NSR for 10-15 years
Pollution Control and Prevention Projects (P2 projects)	none	Excludes P2 projects from NSR unless emission increase would contribute to violation of NAAQS, PSD, or air quality related values in a Class I area. Permitting authority responsible for air quality determination	Excludes P2 projects from NSR unless emission increase would contribute to violation of NAAQS, PSD or air quality related values in a Class I area. EPA will provide a list of presumptively eligible technologies

Provision	Prior Existing Regulation	1996 Clinton Proposed Rule	2002 EPA Final Rule
Emissions Calculation Test Methodology (baseline and test changes)	Actual to potential test for all industrial sources except electric utilities which have an actual to future actual test based on a facility's emissions over 24 consecutive months within the most recent five-year period	Proposed options ranging from applying the actual to future actual test to only electric utilities or to all industrial sources, or eliminating it	Applies the utility's actual to future actual test to all industrial sources based on a facility's emissions over two consecutive years within the most recent ten-year period

What Is the Controversy?

The CAA requires a preconstruction review of, and a permit for, almost any modification of an air polluting source or any major new source. Assuming that a state has an EPA-approved State Implementation Plan (SIP), which spells out the state's strategy for complying with NAAQS, regulatory approval to construct the new source or modify the existing source must come from the appropriate state agency. To receive this "Permit to Construct," the applicant must show that the proposed source or modification will not result in, or exacerbate, violation of a NAAQS, either locally or downwind. In addition, applicants must show that their proposal will not result in local or downwind exceedences of increments of increased air pollution allowed under Prevention of Significant Deterioration (PSD) regulations in areas complying with NAAQS. It is this preconstruction review process that is called New Source Review (NSR).¹⁷

The NSR process is triggered for any new source that potentially could emit 100 tons annually (or less in some areas) of any criteria air pollutant, and by any modification that will cause a significant increase in annual emissions (regulatorily defined as 40 tons for SO₂ and NO_x¹⁸). The specific NSR requirements for affected sources depend on whether the sources involved are subject to the PSD or the non-attainment provisions.¹⁹ If covered by PSD, the source is required to install Best Available Control Technology (BACT), which is determined on a case-by-case basis, and which cannot be less stringent than the federally determined New Source Performance Standard (NSPS) for that pollutant. If covered by non-attainment

¹⁷ Some restrict the term "NSR" to the review process in a nonattainment area only; the review process in an attainment area being called "PSD pre-construction review". This paper will use the term to indicate both. In addition, new and modified sources must meet New Source Performance Standards (NSPS).

¹⁸ 40 CFR 52.24(f)(10) for nonattainment; 40 CFR 52.21(b)9230(i) for PSD.

¹⁹ It should be noted that a source can be affected by the PSD requirements for one pollutant, and by the nonattainment requirements for another pollutant.

provisions, the source is required to install Lowest Achievable Emission Rate (LAER) and obtain applicable offsets for that particular area.²⁰ Like BACT, LAER must not be less stringent than the federal NSPS.

Despite the breadth of coverage suggested by NSR, few permits have been issued to coal-fired power plants over the program's history.²¹ If this situation is examined from the perspective of new construction, the lack of permits is not too surprising. Current U.S. coal-fired electric generating capacity is about 300,000 megawatts (MW), and has remained steady at that level for the last ten years.²² As indicated in table 2, additions to coal-fired capacity, while greater than retirements, have not been significant. Capacity that began operation between 1989-2000 constitutes about 3% of total current coal-fired capacity.

Table 2: U.S. Coal-fired Electric Generating Capacity Additions, 1989-2000 (net summer capacity)

Year	Capacity Additions (MW)	Retirements (MW)
1989	1,967	379
1990	3,063	175
1991	792	377
1992	498	254
1993	0	104
1994	540	461
1995	1,036	2
1996	1,611	16
1997	0	293
1998	0	2
1999	55	192
2000	16	40
Total 1989-2000	9,578	2,295

Source: Energy Information Administration, *Inventory of Power Plants in the United States*, various years.

²⁰ For details on these provisions and their requirements, see *Clean Air Act, Part C – Prevention of Significant Deterioration of Air Quality, sections 160-169; and, Part D – Plan Requirements for Nonattainment Areas, sections 171-178.*

²¹ Environmental Protection Agency, Letter to Chairman Inhofe (March 26, 1999), p. 2.

²² Data represent net summer capacity. Energy Information Administration. Annual Energy Review 1998, DOE/EIA-0384(98), July 1999. P. 219.

The dynamism in coal-fired generation is the continuing operation of existing coal-fired facilities. As indicated by table 3, despite the general lack of new plant construction, coal-fired electricity generation and related coal consumption has continued to climb over the past decade. This increase results from utility efforts to optimize performance of existing coal-fired facilities despite their increasing age. Historically, as plants age they become less reliable and less efficient, leading utilities to derate them and move them from baseload to cycling duties. However, as indicated in table 4, contrary to historical expectations, utilization of coal-fired capacity has increased over the past decade, and the efficiency of units has not decreased.

Table 3: Coal Consumption and Coal-fired Generation, 1989-2000

Year	Coal Consumption (thousand short tons)	Net Generation (billions Kwh)
1989	781,672	1,584
1990	790,244	1,591
1991	793,666	1,591
1992	805,140	1,621
1993	842,153	1,690
1994	848,796	1,691
1995	860,594	1,709
1996	907,209	1,795
1997	931,949	1,845
1998	946,295	1,874
1999	949,802	1,881
2000	994,933	1,966
2001	975,570	1,904

Source: Net generation, coal consumption data from Energy Information Administration, *Annual Energy Review 2001*, July 2002.

This suggests that the economics of plant maintenance has changed fundamentally over the past decade or so, making it economic for utilities to spend more to maintain their coal-fired capacity than was the case previously. The question the EPA lawsuits raise is whether these efforts to maintain or even to expand generation from existing coal-fired facilities – compared to the degradation of capacity that would be expected – represent “routine maintenance” or a “modification” of those facilities under the CAA. If such maintenance does represent a “modification,” then the CAA would require the installation of pollution control equipment; “routine maintenance,” on the other hand, would not trigger the

requirement for new controls. With the restructuring of the electric utility industry placing ever-greater focus on plant economics, this issue has intensified in recent years.²³

Table 4: Coal-fired Generation Capacity Factors and Heat Rates: 1989-2001(based on net summer capacity)

Year	Capacity Factor	Heat Rate
1989	59.1%	10,302
1990	59.1%	10,331
1991	59.1%	10,344
1992	59.8%	10,285
1993	62.2%	10,303
1994	62.0%	10,336
1995	62.7%	10,342
1996	65.4%	10,383
1997	67.2%	10,364
1998	67.7%	10,363
1999	68.1%	10,346
2000	71.0%	10,378
2001	68.7%	10,435

Source: Net summer capacity, net generation, coal consumption data from Energy Information Administration, *Annual Energy Review 2001*, July 2002.

What Is a Modification?

As noted above, there is no firm data that NSR has seriously obstructed the construction and operation of new power plants. The controversy over NSR with respect to power generation focuses on existing facilities and under what conditions they meet the modification trigger that would require them to undergo NSR. As defined under the 1970 Clean Air Act, a modification is “any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air

²³ See: Larry Parker and John Blodgett, *Electricity Restructuring: The Implications for Air Quality*, CRS Report 98-615 ENR, July 16, 1999.

pollutant not previously emitted.”²⁴ In subsequent regulations issued in 1975 with respect to New Source Performance Standards (NSPS), EPA defined modification as any physical or operational change that resulted in any increase in the maximum hourly emission rate (kilograms per hour) of any controlled air pollutant.²⁵ In addition, EPA regulations stated that any replacement of existing components that exceeded 50% of the fixed capital costs of building a new facility placed the plant under NSPS, regardless of any change in emissions.²⁶ With the advent of NAAQS non-attainment provisions (Part D), Prevention of Significant Deterioration provisions (Part C), and NSR in 1977, a different approach to defining modification was appropriate as the focus was shifted from enforcing NSPS emission rates to compliance with NAAQS and PSD. In promulgating regulations for the PSD and non-attainment programs, EPA defined “significant” increase in emissions in terms of tons per year emitted by a major source. For sulfur dioxide and nitrogen oxides, the threshold is 40 tons per year.²⁷ Facilities that exceed that threshold are subject to NSR.

Enforcing these thresholds has been more difficult than their apparent clarity would suggest. EPA’s thresholds for the NSPS program generally represent no practical constraint on life extension efforts by utilities. Most life extension efforts improve the availability and reliability of generating units, not their capacity to generate. Thus, their maximum hourly emission rate would not change. Likewise, most life extension efforts cost far less than the 50% asset value threshold.

NSR review has a far more sensitive trigger – a tonnage increase in pollutant output. Because life extension does improve availability and reliability, it is likely to increase emissions over levels emitted before the life extension activities were undertaken. But how does one measure the change? What are the baselines²⁸?

These issues came to a head in the late 1980s when EPA decided to enforce NSR against facilities undergoing life extension efforts. In 1988, the EPA ruled that a life extension project by Wisconsin Electric Power Company (WEPCO) met the trigger for NSR because of the potential for increased emissions from the facilities after the project compared with actual emissions from the facilities before the project.

²⁴Section 111(a)(4).

²⁵ 40 CFR 60.14(a) (1975).

²⁶ 40 CFR 60.15 (1975).

²⁷ For PSD, see 40 CFR 52.21(b)(23)(i); for nonattainment, see 40 CFR 52.24(f)(10)

²⁸ Defining the baseline has been a key issue. Every powerplant has what is called “nameplate” capacity, which indicates its theoretical size; but the actual output is defined by its “operating capacity,” which is determined by the engineering and operational details of the individual plant. Moreover, from an engineering perspective, the operating capacity declines over time as a result of boiler deterioration, pipe clogging, and other predictable changes due to use. The issue is, then, what level of capacity restored by renovations trigger NSR: only renovations that increase capacity beyond the facility’s nameplate capacity? those that increase capacity beyond the *original* operating capacity? those that increase capacity above an engineering-defined capacity that projects declines over time? Or those that increase potential emissions above the actual emissions before the modification?

After considerable litigation²⁹ and congressional debate, EPA modified this “actual to potential” emissions trigger with respect to electric utilities in 1992.³⁰ The new “test” to determine the applicability of NSR compares a facility’s actual emissions before the modification with its projected actual emissions after the modification (“actual to future actual”). Specifically, “actual emissions” equal the facility’s average emission rate during a 2-year period out of the preceding 5 years before the proposed change. “Future actual” is the product of the facility’s projected emission rate after the change and its projected actual utilization based on historical and other data. These are the current NSR regulations for utility plants.

How Does Routine Maintenance Fit?

Fundamental to the debate on NSR enforcement with respect to existing facilities is the notion of “routine maintenance.” In promulgating implementing regulations, EPA exempted certain activities from the definition of physical or operational change. Among those activities exempted was: “maintenance, repair, and replacement which the Administrator determines to be routine for a source category....”³¹ In addition, increases in production rates that do not involve capital expenditures do not constitute a modification. Responding to this situation, utilities began to spread out their life extension efforts in an attempt to make them fit into their routine maintenance schedules.³² Indeed, the term “life extension” has fallen out of the professional literature, replaced with terms like capital improvement, performance improvement and unit integrity, condition assessment, life operation management, review of continued operating requirements, and asset management.³³ The commonly used term currently is rehabilitation program.³⁴ By spreading out the life extension efforts and integrating them into facilities’ operation and maintenance schedules, the distinction between “modification” and “routine maintenance” is effectively blurred, and arguably, eliminated.

²⁹ *Wisconsin Electric Power Company v. Reilly*, 893 F.2d 901 (7th Cir. 1990).

³⁰ *57 Federal Register* 32314-32339 (July 21, 1992).

³¹ 40 CFR 60.14(e)(1)

³² As observed by Robert Smock, Editor, “Power Plant Life Extension Trend Takes New Directions,” *Power Engineering* (February 1989): “There are signs that many utilities will not use the term “life extension” to describe their spending on old power plants, even though extended life is one of the major goals of the spending program. The reason for the aversion to the term lies in the 1970 Clean Air Act. That federal law requires all power plants constructed after August, 1971 to restrict emissions of air pollutants such as sulfur dioxide. Plants built prior to 1971 are exempt, which includes most of the early candidates for life extensions. The problem is that the law also says that grandfathered plants can lose their exemption if they are “modified” or “reconstructed” in a major way and emission of proscribed pollutants are increased.”(p. 21)

³³ Robert G. Presnak and Bock H. Yee, “Life Extension: The Benefits Are Real,” *Power Engineering* (December 1993), pp. 25-27

³⁴ For a current view of managing existing facilities, see Jason Makansi, “Rehab: Get the Most from the Existing Asset Base,” *Power* (June 1999), pp. 30-40.

These “rehabilitation” practices that extend the design life of a power plant represents a change in what had earlier been considered accepted maintenance practices: Before the early 1980s, power plants were generally assumed to have fixed lives – 30-40 years – after which they would be replaced or relegated to cycle or peaking duties. In its 1981 *Technical Assessment Guide*, The Electric Power Research Institute (EPRI) defined a unit life as follows:

Unit life is an estimate of the book life of the plant. The maintenance costs include sufficient funds to replace minor equipment that wears out before the unit life shown.³⁵

In its cost analyses for coal-fired powerplants, this unit life was assumed to be 30 years.³⁶ By its 1986 *Technical Assessment Guide*, the definition of unit life was the same, but the assumed unit life for a coal-fired powerplant was 40 years.³⁷

The flux in the notion of fixed powerplant lives was evident in the early 1980s debate on proposed acid rain legislation. In utility analyses of anticipated cost of retrofitting their existing powerplants with additional pollution controls, utilities split on the issue of retirement, either as a pollution control strategy, or as utility policy in general. For example, American Electric Power, a leading opponent of such legislation, conducted its cost analysis with assigned specific retirement dates for its existing powerplants ranging from 30-40 years. Indeed, it considered early retirement to be a viable, cost effective pollution control option.³⁸ In contrast, analyses by other utilities assumed neither any specific retirement dates, nor early retirement as a control option.³⁹

Up to this time, routine maintenance practices did not attempt to arrest or reverse the normal deterioration of the powerplant’s performance over its life span. Industry aging trends with respect to powerplant performance with standard maintenance practices (as suggested by the EPRI definition) are well documented.⁴⁰ In general, aging affects both the efficiency of the powerplant along with its reliability and availability. Degradation of key components, such as turbines, waterwall tubing, and reheaters, slowly reduces a powerplant’s efficiency in

³⁵Electric Power Research Institute, *TAG – Technical Assessment Guide*, Palo Alto: EPRI, (May 1982), p. App B-48.

³⁶*ibid.*, p. App B-55

³⁷Electric Power Research Institute, *TAG – Technical Assessment Guide (volume 1: Electricity Supply – 1986)*, Palo Alto: EPRI (December 1986), p. B-43.

³⁸ See: American Electric Power, “Acid Rain Control Costs,” in *Acid Rain: A Technical Inquiry, Hearings* before the Committee on Environment and Public Works, U.S. Senate, May 25 and 27, 1982, p. 736.

³⁹For example, see: *ibid.*, Responses to Written Questions, pp., 748 (Southern Company Services), 756 (Public Service of Indiana), 767 (Indianapolis Power & Light), 790 (Ohio Edison).

⁴⁰In particular, see: H. H. Heiges and H. G. Stoll, “Power Plant and Turbine-Generator Upgrading Economics,” presented at EPRI and EEI’s Fossil Plant Life Extension Workshop, June, 1984.

converting heat to steam and steam to electricity. The result is a higher heat rate and less output. As shown in Figure 1, “average industry maintenance practice” results in heat rates increasing by about 0.3 percent annually during the first ten years of operation, dropping to below 0.2 percent after that.⁴¹

Figure 1: Trend of Power Plant Heat Rate with Age

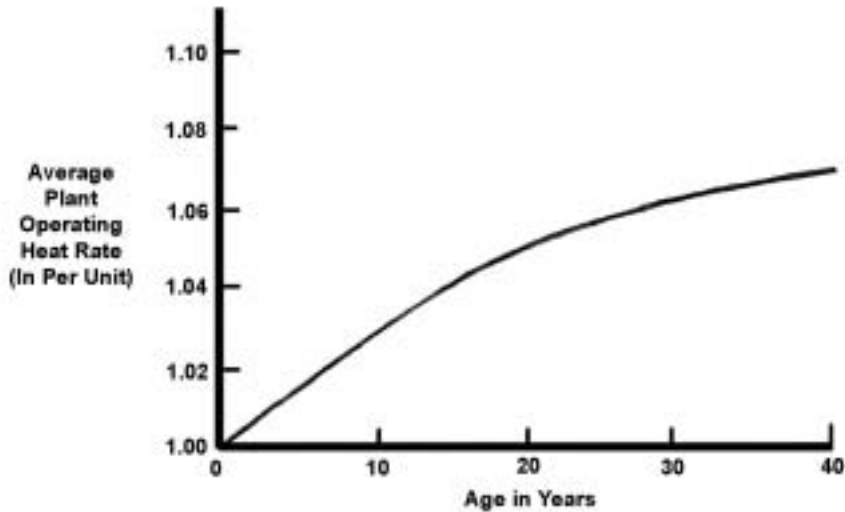
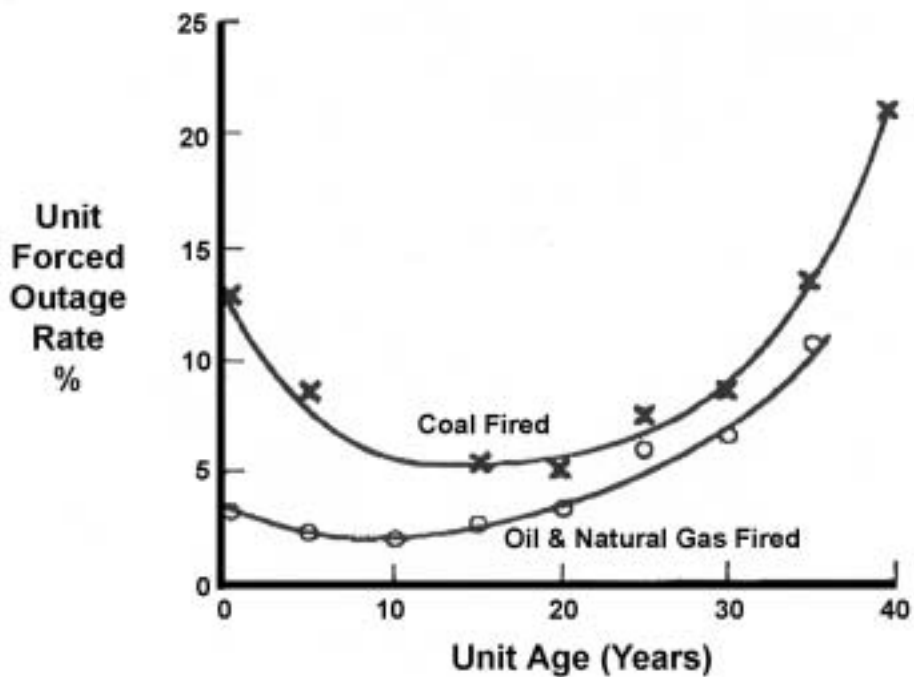


Figure 2: Impact of Power Plant Aging on Reliability of Fossil-Fired Units 50 to 200 Mw



⁴¹*ibid.*, pp. 12-2 - 12.3.

Likewise, the aging of components eventually increases the forced outage rate of powerplants as component failure becomes more frequent. As indicated in Figure 2, reliability of coal-fired facilities peak at between 10 and 20 years of service and then begins to deteriorate. By 35 years of operation, a facility's forced-outage rate has increased by 10 percentage points. In particular, older facilities begin to have significantly longer outages as they age, in line with the failure of major equipment, such as the turbine-generator.⁴²

As indicated by the data presented in table 3, these documented trends based on 1980 "average industry maintenance practices" are not occurring. Heat rates for coal-fired facilities are remaining relatively stable while capacity factors are increasing substantially. It is obvious that the rehabilitation programs utilities initiated in the 1980s and continuing to the present have been successful in dramatically reducing the aging process with respect to coal-fired facilities. However, is this success a violation of the modification definition of NSR? If "routine maintenance" is defined in terms of "average industry maintenance practice" at the time of the 1970 or 1977 Clean Air Act Amendments, then a strong case can be made that it is – major components are being replaced or upgraded that would not have been under average industry maintenance practices of that time. Yet, if "routine maintenance" is interpreted to mean industry practices at the current time, then one can argue that rehabilitation has become routine over the past 20 years, and thus does not represent a modification.

This is fundamental to the way one views the proposed clarifications to the definition of routine maintenance proposed by EPA. If one believes that EPA's routine maintenance exemption as enunciated in the 1970s was delimited and not a license to rehabilitate existing facilities, then one would conclude that many of the industry's rehabilitation activities of the last 20 years go beyond what NSR requirements allow. Thus, any argument by the current Administration that its proposed NSR revisions would reduce emissions beyond that required under current law would be untenable as enforcement of current law would require existing sources subject to NSR to meet the stringent standards of either BACT or LAER. This perspective that applying NSR requirements to rehabilitation would reduce emissions is consistent with the enforcement initiative of the Clinton Administration, an initiative for which the Bush Administration has stated its support.

In contrast, if one believes that an exemption for routine maintenance is appropriate and should be defined in terms of current industry practices, then one would conclude that the potential threat of NSR (and the installation of BACT or LAER) prevents owners from making cost-effective improvements in the overall performance and efficiency of their existing facilities (e.g., improved heat rates). From this perspective, NSR discourages plant owners from upgrading facilities operating with old, worn-out, inefficient components, thereby foregoing opportunities to conserve energy and to reduce carbon dioxide emissions by installing newer, more efficient components. This perspective that NSR discourages energy efficiency is

⁴²*ibid.*, pp. 12-3 - 12.5.

reflected in the Bush Administration's proposed revisions to routine maintenance published in December, 2002.⁴³

This second view that rehabilitation is in fact routine also reflects the defense of many of the utilities sued by the Justice Department under the Clinton Administration. For them, rehabilitation programs are the norm for the industry and, therefore, should not trigger NSR. In its proposed revisions to the definition of routine maintenance, the Bush Administration cited analyses by the Tennessee Valley Authority (TVA) and First Energy that they would have "lost" 32% and 39% of their coal-fired capacity respectively, if they had capped their emissions under a "narrow" routine maintenance exclusion.⁴⁴ With the decision of the Bush Administration to support revisions to NSR, utilities subject to litigation originating under the Clinton Administration's enforcement initiative are using EPA's new policy position as a defense.⁴⁵

Emissions Impact

In announcing the NSR suits in 1999, the EPA Administrator stated that "controlling the sulfur dioxide and nitrogen oxides from these plants could lead to an 85 to 95 percent reduction respectively in these pollutants."⁴⁶ Based on her statement, this would reduce SO₂ emissions by 1.87 million tons and NO_x emissions by 0.63 million tons. Also, given the widespread nature of life extension efforts, it is reasonable to assume that further reductions would be achieved as other utilities either installed BACT or retired their offending facilities. Thus, at first glance, it would appear that very substantial emission reductions could be achieved by rigorous enforcement of NSR's regulations using the existing definition of "routine maintenance" rather than EPA proposed new one.

The best analysis of future possibilities under current NSR regulations is by the Energy Information Administration (EIA).⁴⁷ The three relevant scenarios are: (1)

⁴³67 *Federal Register* 80290-80314 (December 31, 2002).

⁴⁴67 *Federal Register* 80302 (December 31, 2002)

⁴⁵For example, on January 8, 2003, Southern Indiana Gas & Electric Company (SIGECO) filed a "notice of supplemental authority" with the U.S. District Court for the Southern District of Indiana arguing that EPA's proposed revisions undercuts the government's case against it. Specifically, the company argues that its activities that invoke the lawsuit are far smaller than those that would be allowed under the revised rule, and that language in the proposal supports its argument that the company did not receive fair notice of the interpretation underlying the enforcement action. On February 18, 2003, the U.S. District Court for the Southern District of Indiana rejected the claims by SIGECO, calling testimony by SIGECO experts on the routine maintenance issue "irrelevant and unpersuasive." This follows a ruling on February 13, 2003 by the same Court that "EPA's interpretation for routine maintenance is reasonable and persuasive."

⁴⁶ Carol M. Browner, Administrator, Remarks Prepared for Delivery, Clean Air Enforcement Press Conference (Washington, D.C.: November 3, 1999).

⁴⁷Energy Information Administration, *Strategies for Reducing Multiple Emissions from* (continued...)

reference: no enforcement (including halting current lawsuits); (2) NSR 32: enforcement limited to the current lawsuits; and (3) NSR All: enforcement expanded to include all coal-fired plants over 25 megawatts. The projected 2010 sulfur dioxide (SO₂) and nitrogen oxides (NO_x) results under these three scenarios are presented in table 5. As indicated, depending on one's expectation with respect to NSR enforcement in lieu of the EPA proposed rule on routine maintenance, the difference in emissions could be on the order of a factor of five.

Table 5: EIA's 2010 NSR Reference Cases: Emissions from Coal-fired Electric Generating Facilities

Scenario	NO _x Emissions (million tons)	SO ₂ Emissions (million tons)
Reference	4.20	9.70
NSR 32	3.78	9.10
NSR All	1.56	1.94

Source: EIA, *Strategies for Reducing Multiple Emissions from Power Plants*, table 20.

However, the CAA is a complex piece of legislation built up over time. In the case of SO₂, any reduction achieved under NSR would interact with reduction requirements under title IV – a SO₂ reduction program designed with different premises than NSR. Specifically, title IV limits total SO₂ emissions from utilities to 8.9 million tons beginning in the year 2000, with interim reductions required in 1995. The cap is enforced through tonnage limitations at individual existing utility plants and by an emission offset requirement for new facilities. SO₂ emissions from most existing sources are capped at a specified emission rate times a historical (1985-1987) average fuel consumption level. Thus the tonnage limitation is based on preset and historical data, not regulatory limits. To implement the program, title IV created a comprehensive emissions allowance system. An allowance is a limited authorization to emit a ton of SO₂ during or after a specified year. Issued by EPA, allowances are allocated to existing facilities in accordance with the emission rate/fuel consumption formulas detailed in the law. Such allowances may be used at the plant they are allocated to, or they can be traded or banked for future use or sale. The program has been very successful with nearly 100% compliance.

This 1990 CAA Amendments program does not integrate well with the 1977 CAA Amendments NSR program. Except that they both focus on existing facilities and SO₂, they have little in common. The NSR is concerned with modifications at existing facilities and installation of BACT. Title IV doesn't address whether existing facilities continue operation or not, or whether a specific facility installs BACT or not; compliance with the cap is the determining criterion. NSR is an enforcement mechanism to assure compliance with individual plant standards; title

⁴⁷(...continued)

Electric Power Plants with Advanced Technology Scenarios, chapter 5: Potential Impacts of New Source Review Actions (October 2001), pp. 57-63.

IV is a program to reduce aggregate SO₂ emissions by permitting utilities considerable flexibility in determining appropriate compliance strategies.

The current SO₂ NSPS, the “floor” for any BACT or LAER determination, is a percentage reduction requirement that reduces SO₂ emissions by 70%-90%, depending on the coal burned. However, the allocations under title IV for existing coal-fired facilities is not as stringent and can be met with low-sulfur coal. Thus, any facility that installed BACT under NSR would “overcontrol” SO₂ under title IV, and, therefore, have excess allowances available for sale or to bank for future use. Consequently, any reductions achieved because of NSR enforcement could be rendered moot by title IV, if the affected plant subsequently sold its SO₂ reduction to some other facility not covered by an NSR action.⁴⁸ Except for any TVA reductions, the net result would be no reductions, at least theoretically. Title IV does not provide for adjusting allowance allocations as a result of NSR enforcement. Rather, the law explicitly bases its allowance allocations on historical data, not on any presumption of compliance with NSPS or SIP requirements. To avoid this “allowance trap,” either Congress would have to change the law, or utilities would have to agree to surrender the excess allowances created by any NSR enforcement action. Indeed, NSR settlements and agreements in principle resulting from EPA’s enforcement initiative have included the retirement of SO₂ allowances that the utilities could have used to emit additional pollution elsewhere.⁴⁹

The situation with potential NO_x reduction is more complex. First, there is the interaction of NSR and the NO_x NSPS. Unlike the very stringent SO₂ NSPS, the NO_x NSPS historically has not reflected the cutting edge in technology development.⁵⁰ Until the new standard was set in 1998, the NO_x NSPS for coal-fired facilities was 0.6/0.5 lb. of NO_x per million Btu of heat input, depending on the type of coal burned. This standard, set in 1979, could be met with fairly simple combustion modifications or low-NO_x burners, and did not require the installation of pollution control devices such as selective catalytic reduction (SCR). Indeed, the standard did not reflect the state of the art with respect to low-NO_x burners.

In 1998, EPA promulgated a new NO_x NSPS for coal-fired facilities of 0.15 lb. of NO_x per million Btu – a standard more in line with available technology. However, this new standard was challenged in court. In September, 1999, the D.C. Court of Appeals vacated the new NO_x NSPS with respect to modified utility boilers, while later upholding the NSPS with respect to new sources.⁵¹ By vacating the

⁴⁸ The TVA Compliance Order would require retirement of allowances equal to any SO₂ reductions achieved as a result of the compliance order.

⁴⁹For example, see U.S. Environmental Protection Agency, “United States and New Jersey Announce Clean Air Act Coal-fired Power Plant Settlement With PSEG Fossil LLC Effect Will Cut New Jersey Industrial Sulfur Dioxide Emissions by 32%,” EPA Press Release, January 23, 2002.

⁵⁰ Larry Parker, *Nitrogen Oxides and Electric Utilities: Revising the NSPS*, CRS Report 96-737 ENR (October 13, 1998).

⁵¹ *Lignite Energy Council v. Environmental Protection Agency*, Order No. 98-1525, D.C. (continued...)

modified standard, the NSPS for modified sources returned to the previous 1979 standard until such time as EPA proposes a revised NSPS. As a result, the floor for determining BACT or LAER for modified coal-fired sources is unclear at the current time. If the floor is the current modified NSPS as set in 1979, reductions achieved by NSR enforcement would be considerably less than that suggested by some. In contrast, if the floor is the new 1998 NSPS, the reduction would be substantial. Surveying BACT determinations over the time period 1991-1995 sheds no light on what BACT might be currently: data indicate permitted emission rates ranged from 0.15 to 0.5 lb. per million Btu.⁵² Thus, it is difficult at the current time to project what any actual NO_x reduction would be achieved by increased NSR enforcement.

The confusion is exacerbated by the interaction of NSR and title IV. The NO_x reduction program under title IV differs substantially from the SO₂ program. Like the NSPS program, the title IV NO_x program is based on emission rates, not tonnage limitations. The difference is that the emission rate for the title IV program is set for existing facilities to be achieved in 1995 or 2000 (depending on the facility), regardless of whether the facility is modified or not. In addition, the rate limitation for most boilers under title IV is 0.45 to 0.5 lb. per million Btu, or more stringent than the 1979 NO_x NSPS. Thus, you have the curious situation of some existing coal-fired facilities having emission controls since 1995 that are more stringent than the existing NSPS – a situation that continues currently with the court action on the modified NSPS.

A third interaction is between NSR and the NO_x SIP call. The NO_x SIP Call (also called the Ozone Transport Rule), requires 21 eastern and midwestern States and the District of Columbia to reduce emissions of NO_x to prevent interstate transport of ozone pollution.⁵³ To achieve the necessary reductions, EPA stipulates an emission budget for each of the affected states, with each state free to decide on what controls to use to maintain emissions within those budgets. With much of the reduction likely to come from coal-fired electric powerplants, EPA is recommending States agree to a regional cap and trade program to implement the reduction program. The potential interaction between this program and an NSR enforcement is unclear, as the allowances used in any NO_x trading program would have a regulatory, rather than a statutory, basis.

⁵¹(...continued)

Court of Appeals (September 21, 1999). In a separate opinion issued December 21, 1999, the court upheld the NSPS with respect to new sources.

⁵² Office of Air and Radiation, EPA, *Analyzing Electric Power Generation under the CAAA* (July 1996).

⁵³ Environmental Protection Agency, *Findings of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone*, 63 *Federal Register* 57356-57538, October 27, 1998. Further litigation removed the state of Wisconsin from the list of states affected by the rule.

Proposed Alternatives

Alternatives to the current NSR situation focus on either energy or environmental considerations. For example, the Administration's proposed revisions to routine maintenance are an outgrowth of the President's National Energy Policy and are intended "to provide greater regulatory certainty without sacrificing the current level of environmental protection...." The policy goal is not to reduce emissions. As stated in the proposed rule:

What these [EPA's] analyses indicate, however, is that regardless of which scenario is closest to what comes to pass, none of the proposed provisions related to the RMRR [routine maintenance, repair, replacement] exclusion will have a significant impact on emissions from the power sector.⁵⁴

The Bush Administration's NSR focus on energy policy contrasts directly with the focus of the Clinton Administration's enforcement initiative where, by seeking to enforce NSR requirements, EPA attempted to exploit an existing authority to reduce emissions. Likewise, proposed legislation in the 107th Congress to define a modification in terms of a power plant's age was another attempt to use NSR as an emissions reduction program.

NSR is one approach that the Clean Air Act takes to control emissions from existing sources, but arguably more efficient and more effective methods to ensure declining emissions from existing sources over time have been developed since NSR was added to the CAA in 1977. For example, title IV of the CAA, enacted in 1990, explicitly and substantially reduces SO₂ and NO_x emissions from existing utility plants. In fact, title IV reduced more SO₂ emissions from coal-fired electric generating facilities in its first year of implementation (1995) than NSR has in its 20 years of existence. The "cap and trade" program has had nearly 100% compliance (indeed, substantial over-compliance); the implicit logic of EPA's lawsuits suggests NSR's compliance with respect to electric generating facilities has been near zero. The title IV program began without significant delays (SO₂ program on-time, NO_x program 1 year late); the EPA lawsuits could take years to resolve with uncertain results.

Reform NSR to Permit Current Utility Rehabilitation Practices: The Administration Proposal

Published in December, 2002, the Bush Administration's proposed definition of routine maintenance would permit current utility rehabilitation practices to continue without the threat of triggering NSR. As suggested above, the proposed changes to the definition of routine maintenance are focused on energy policy considerations, not environmental considerations. If one's baseline is current utility emissions, EPA believes, as stated above, the proposed changes will have no significant impact on emissions.

⁵⁴ 67 *Federal Register* 80304 (December 31, 2002).

The proposed rule suggests two approaches for determining whether a utility's activities exceed routine maintenance. Both approaches involve the use of a cost trigger, and EPA suggests that the two could be used together, or the second approach could stand alone. The first category, "Annual Maintenance, Repair, and Replacement Allowance," would provide an exemption for safety, reliability, and efficiency activities whose capital and non-capital cost fell below a specific cost threshold. The second category, "Equipment Replacement Approach," would provide an exemption for replacing safety, reliability, and efficiency rated components with new, functionally equivalent equipment if the cost of the replacement components is below a specific threshold. Obviously, using a cost threshold to define routine maintenance means that the stringency of NSR with respect to an existing source would depend substantially on the cost estimate used to set the trigger.

However, no proposed estimates are provided in the proposed rule for an "annual, maintenance, repair and replacement allowance." EPA's quantitative discussion of such estimates in the rule consists of noting the IRS values for such items (ranging from 0.5% to 20% of invested costs, depending on industry); and estimates contained in standard reference manuals for the chemical process industry (ranging from 2% to 10% for that industry). From this literature review, EPA concludes: "Based on information contained in the resources mentioned above, the appropriate annual maintenance percentages would be in the range of 0.5% to 20%, depending on the industry."⁵⁵ Even this broad conclusion is more precise than the actual proposal as the proposal also states that EPA is considering whether or not to exclude from the allowance calculation costs associated with replacing components that experience unanticipated failure or a catastrophic failure.⁵⁶

With regard to a cost trigger with respect to the second approach EPA anchors its discussion on the 50% of the assessed value reconstruction cost trigger of the NSPS, stating:

Thus, we believe that the 50% capital replacement threshold used under the NSPS might constitute an appropriate limitation on when identical or functionally equivalent replacement should qualify as RMRR under the equipment replacement provision without regard to other considerations.⁵⁷

EPA does not provide any analyses to reinforce its belief that 50% is an appropriate cost trigger for its replacement approach, and notes that "there are other considerations pointing in favor of a threshold lower than the 50% reconstruction threshold that may be appropriate to bound the equipment replacement provision."⁵⁸

This position by EPA appears to reflect two somewhat contrasting perceptions with respect to NSR.

⁵⁵67 *Federal Register* 80298 (December 31, 2002).

⁵⁶67 *Federal Register* 80299 (December 31, 2002).

⁵⁷67 *Federal Register* 80301 (December 31, 2002).

⁵⁸ibid.

First, EPA believes that it is not reasonable for the replacement approach to exclude from NSR activities that involve the total replacement of an existing entire process.⁵⁹ However, a 50% cost trigger would, in fact, permit such activities, at least for power plants. As CRS noted in reports beginning in 1985, the 50% reconstruction trigger is not a serious constraint on utility rehabilitation activities.⁶⁰ Indeed, a review of EPA's Applicability Determination Index (ADI) database indicates no instance where the reconstruction provisions of the NSPS regulations has been applied to an electric generating facility.⁶¹ EPA appears to recognize the potential that a 50% cost trigger would never be invoked and, therefore, suggests a limiting principle for rehabilitation programs based on "functional equivalence" of replaced components. Even this may have problems, as stated by EPA:

We recognize that it may sometimes be difficult to determine where to draw the line between an activity that should be treated as an excluded replacement activity and one that should be viewed as a physical change that might constitute a major modification when the replacement of equipment with identical or functionally equivalent equipment involves a large portion of an existing unit. At the same time, we believe it is important to provide some clear parameters for making this determination.⁶²

Whether those parameters would be clearer than the current NSR trigger remains to be seen.

Second, while EPA believes that complete reconstruction should not be allowed, it also believes that the breadth of exclusion permitted by any definition of routine maintenance is irrelevant in terms of reducing powerplant emissions. In a qualitative discussion of utility behavior and the potential emissions impact of a "narrow" definition of routine maintenance, EPA states:

...a narrow RMRR exclusion that is clearly established is not expected to achieve significant reduction in historic emission levels, and might even lead to area wide emissions increases. Most facilities would take lawful steps to avoid having to obtain an NSR permit that would impose strict limitations, even when replacements would be found under this narrow exclusion to be non-routine.⁶³

If the breadth of definition does not affect emissions, it is not clear why it matters whether a utility can completely reconstruct a facility. If EPA's concerns are primarily energy policy driven and focused on providing industry with clear parameters, a simple cost trigger without any functional restraint is well within the rationales presented in its routine maintenance proposal. Indeed, the Bush Administration has stated that it believes that multi-pollutant legislation would be more effective and efficient in reducing pollutants than rigorous NSR enforcement.

⁵⁹ibid.

⁶⁰Larry Parker, et. al., *The Clean Air Act and Proposed Acid Rain Legislation: Can We Get There From Here?* CRS Report 85-50 (February 21, 1985), p. 46.

⁶¹ Telephone conversation with EPA, February 3, 2003.

⁶²67 *Federal Register* 80301 (December 31, 2002)

⁶³67 *Federal Register* 80302 (December 31, 2002)

Thus, the Administration “Clear Skies” proposal includes an exemption from NSR for facilities complying with provisions contained in the bill.⁶⁴

Replace NSR with Multi-pollutant Legislation⁶⁵

If the object of the Clinton Administration’s NSR enforcement initiative was to reduce SO₂ emissions from coal-fired powerplants, the most straightforward alternative would be to lower the cap on such emissions contained in title IV. The practical effect of the 1990 SO₂ cap was to reduce SO₂ emissions from existing facilities to the level required by the 1971 NSPS. The effect on new sources was to reduce the NSPS to zero, as all emissions now have to be offset. Lowering the existing cap by about two-thirds would achieve roughly the same emission reductions as all existing powerplants meeting the 1978 NSPS, but utilities would have some flexibility in achieving such reductions. Admittedly, utilities would get credit for shutdowns that they would not get under NSR enforcement; however, the administrative and cost advantages of the allowance system might be considered worth it. In any case, it would require new legislation, which could be a long drawn out process.

Similarly, a new “cap and trade” program for NO_x would eliminate the uncertainties involved in the NSR enforcement debate, and, potentially, in several other EPA initiatives with respect to NO_x emissions. In that context, EPA has been strongly urging states to consider a regional cap and trade program in implementing its NO_x SIP Call, and any possible compliance with Section 126 petitions. Indeed, EPA made such a program a part of its proposed Federal Implementation Plan (FIP) for states that do not submit adequate SIPs under the SIP Call and its compliance plan for implementing approved Section 126 petitions. However, to implement a regionwide cap and trade program under the NO_x SIP Call for NO_x would require either extraordinary cooperation between the states affected (because of the SIP process), or new EPA authority.

The Administration apparently agrees with this position. In February 2002, the Bush Administration announced its “Clear Skies” proposal to place emission caps on electric utility emissions of SO₂, NO_x and mercury (Hg). Implemented through a tradeable allowance program the emissions caps would be imposed in two phases: 2010 (2008 in the case of NO_x) and 2018. It was introduced as part of a complete rewrite of Title IV of the Clean Air Act on July 26, 2002, as H.R. 5266. It was introduced in the Senate on July 29 as S. 2815. No action was taken on the proposal in the 107th Congress.

In addition to the emission caps, H.R. 5266/S. 2815 would have substantially modified or eliminated several provisions in the Clean Air Act with respect to

⁶⁴Introduced in the 107th Congress as H.R. 5266 and S. 2815.

⁶⁵For a comprehensive discussion of multi-pollutant strategies, see: Larry Parker and John Blodgett, *Electricity Generation and Air Quality: Multi-Pollutant Strategies*, CRS Report RL30878 (March 13, 2001); for a comparison of multi-pollutant legislation introduced in the 107th Congress, see Larry Parker and John Blodgett, *Air Quality: Multi-Pollutant Legislation*, CRS Report RL31326 (October 22, 2002).

electric generating facilities. With respect to existing facilities, the bills provided an exemption from NSR (and other provisions) for existing facilities that meet specific requirements provided in the legislation.

Replacing NSR with a cap and trade program is not without controversy. Indeed, a report by EPA Region IX found that NSR is very compatible with a cap and trade program.⁶⁶ After examining implementation of California's RECLAIM program from its inception in 1993 to the present, EPA concluded:

RECLAIM's experience seems to demonstrate that cap and trade (CAT) can work with Clean Air Act (CAA) New Source Review (NSR). This may be a function of the types of sources included or the controls in place at many facilities. This lesson is contrary to the commonly reported federal view and should be further researched.⁶⁷

Others also see a conflict between NSR and multi-pollutant legislation. Multi-pollutant legislation introduced by Senator Carper in the 107th Congress, S. 3135, included provisions modifying NSR. Under S. 3135, NSR would have been triggered if the capital costs of replacement components exceeded 50% of the construction costs of a new facilities (similar to current reconstruction regulations and the Administration's proposed second option) or if the rate of emissions (in terms of pounds per megawatt-hour) increased. Unlike the Administration's regulatory proposal, this modification of NSR would occur within the context of a comprehensive series of emissions caps on SO₂, NO_x, Hg, and CO₂ that are laid out in the bill. The Administration's Clear Skies proposal does not include CO₂.

Reform NSR to Reduce Emissions From Existing Facilities

While the above proposal sees a lessening of NSR for existing facilities, either for energy policy reasons or to reduce potential conflict with a cap and trade program, other proposals see an aggressive definition of modification as complementing a cap and trade program. For example, in the 107th Congress, H.R. 1256 (Waxman), and S. 556, as reported by the Senate Committee on Environment and Public Works, contained provisions that would have required all powerplants 30 years or older to meet current NSPS requirements. Essentially, this legislation would have defined "modification" in terms of plant age, not physical or operation change. It would be relatively easy to implement, and, as indicated in table 5 previously, an "all NSR" scenario would result in substantial emission reductions.

Similar to S. 3135, the proposals introduced above modify NSR within the context of a comprehensive series of emissions caps on SO₂, NO_x, and CO₂, along with unit-by-unit emission limitations on Hg. Currently, NSR for powerplants can only result in reduced emissions of SO₂, NO_x, and particulate matter. There is no NAAQS or NSPS for either Hg or CO₂. Thus, to control these additional pollutants,

⁶⁶U.S. Environmental Protection Agency, *An Evaluation of the South Coast Air Quality Management District's Regional Clean Air Incentives Market – Lessons in Environmental Markets and Innovation* (November, 2002).

⁶⁷ibid., p. 68.

additional control regimes would be necessary, particularly for CO₂. By combining NSR with multi-pollutant legislation, one provides a fairly clear picture as to the direction of emission control regulation for the lifetime of a powerplant.

However, this clarity comes at the price of flexibility with respect to utilities complying with the emissions caps. Instead of using market mechanisms, such as trading of emissions credits, to create a cost-effective reduction in all four pollutants, the 30-year rule means that BACT or LAER for SO₂, NO_x, and particulate matter would have to be installed on given plants, regardless of what a more comprehensive compliance strategy might suggest. Thus, it is possible that combining a stringent NSR with multi-pollutant legislation in the manner suggested by H.R. 1256 and S. 556 might increase the overall cost of compliance.

Conclusion: NSR – Ambiguous, Meaningless or Moot?

Much of the popular debate on NSR has focused on “grandfathered” powerplants. One example from a 1998 report by a public interest group states:

The Clean Air Act of 1970, as amended in 1977 and 1990, contains a major exemption that allows older coal-burning power plants to emit between 4 and 10 times the amount of pollution that new plants may emit under the Clean Air Act. In part, this colossal loophole exists because industry lobbyists argued successfully that its older plants would soon retire, and that therefore it would be wasteful to require expensive retrofits to control pollution from these plants. However, over 20 years later, many of these same plants, built in the 30s, 40s, 50s and 60s, are still operating, largely without environmental controls.⁶⁸

The term “grandfathered powerplant” is a much used and little understood concept employed in debate on emissions from existing powerplants. Specifically, “grandfathered” is an ambiguous, and, in some cases, meaningless term generally used to indicate whether a given powerplant is covered under Section 111 of the Clean Air Act. Passed with the 1970 Clean Air Act Amendments, Section 111 requires the EPA to promulgate regulations defining the minimum controls necessary for new sources (including power plants) regardless of their location. Called New Source Performance Standards (NSPS), they require major new sources constructed after their promulgation to install the best system of continuous emission reduction which has been adequately demonstrated according to EPA. Currently, there are NSPS regulations for powerplants that cover three pollutants – sulfur dioxide (SO₂), nitrogen oxides (NO_x), and particulate matter. Typically, “grandfathered” refers to those plants (usually coal-fired powerplants) that were constructed before the effective dates of those NSPS regulations and, hence, not subject to them. NSPS regulations for powerplants were first promulgated in 1971 and revised in 1979. The NO_x NSPS regulations for powerplants were revised again in 1998. Instead of NSPS

⁶⁸ United States Public Interest Research Group, *Lethal Loophole*, U.S. PIRG Education Fund (June, 1998), p. 3.

requirements, such “grandfathered” sources must meet emission rate limits established by a State Implementation Plan (SIP).

Three aspects of the NSPS make the term “grandfathered” at best ambiguous:

- Some emissions of concern, such as carbon dioxide (CO₂) and mercury (Hg) are not criteria air pollutants, and, therefore, not covered by the NSPS for powerplants at the current time. Hence, “grandfathered” would not apply for these pollutants as all powerplants (indeed, all major sources of these pollutants) are “grandfathered.”
- EPA is required to review the NSPS every eight years, resulting in increased stringency for covered pollutants as technology improves (and for determinations of BACT and LAER). Therefore, what powerplants are “grandfathered” is ambiguous as there is no set baseline. For example, the NSPS for NO_x was revised in 1998 to a stringency that only a couple of commercially operating coal-fired powerplants met at the time; by that standard, virtually all coal-fired powerplants are “grandfathered” with respect to NO_x emissions.
- Title IV of the 1990 Clean Air Act Amendments changed the regulation of existing powerplants with respect to SO₂ and NO_x. In some cases, the requirements under title IV for existing sources are more stringent than some of the existing or previous NSPS. For example, under phase 1, some existing “grandfathered” powerplants were required in 1995 to meet NO_x standards more stringent than then-existing NSPS NO_x requirements for new powerplants. Likewise, under phase 2 of title IV, existing “grandfathered” coal-fired powerplants were required in 2000 to meet SO₂ standards that are essentially equivalent to (if not more stringent than) the 1971 NSPS for SO₂. The term “grandfathered” is essentially meaningless under such circumstances.

If the focus of debate about “grandfathered” powerplants is NO_x emissions, then age of plant is not a relevant consideration – fuel source is. Coal-fired facilities, regardless of age, are the relevant focus of any effort to increase NO_x controls. If the focus of debate about “grandfathered” powerplants is SO₂ emissions, then the title IV emissions cap is the relevant consideration. There, age was a consideration in allocating emission credits; however, the relevant definition was not based on NSPS compliance (or any other CAA compliance), but on whether the plant was operational, under construction, or planned at the time of enactment. Indeed, the NSPS for SO₂ for new powerplants is in some ways moot – all new sources must completely offset their emissions under the cap as they receive no allocation of emission credits. The NSPS is effectively zero net emissions. Thus, if reducing SO₂ from electric generating facilities is the goal, shrinking the current cap on SO₂ is the most logical approach. Likewise, a cap on NO_x emission is a logical extension for reducing NO_x emissions from electric generating facilities. EPA favors this approach in addressing transported pollution programs in the Northeast where the agency has proposed state-by-state emissions caps.

The WEPCO decision precipitated public debate and congressional oversight, and the Bush Administration’s proposed revisions to NSR have done the same.

Unlike previous efforts to address NSR, the focus of the Administration's proposed routine maintenance rule is not to reduce pollution, but to facilitate electricity production. The proposed rule's attempt to reduce barriers to energy production by widening the definition of routine maintenance is not attached to legislation to reduce any emissions effects. The Administration has introduced legislation to reduce emissions from powerplants, but promulgation of its proposed routine maintenance rule is not contingent on passage of that legislation. The Administration believes the linkage is not critical as it believes that the definition of routine maintenance will have no effect on emissions. Others may disagree.