(Slip Opinion)

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BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re:	)	
Tennessee Valley Authority	)	CAA Docket No. 00-6
Docket No. CAA-2000-04-008	)	

[Decided September 15, 2000]

FINAL ORDER ON RECONSIDERATION

Before Environmental Appeals Judges Scott C. Fulton, Ronald L. McCallum, and Kathie A. Stein.

TENNESSEE VALLEY AUTHORITY

CAA Docket No. 00-6

FINAL ORDER ON RECONSIDERATION

Decided September 15, 2000

Syllabus

This proceeding concerns an administrative compliance order, as amended (the "Compliance Order"), EPA Region IV issued under the Clean Air Act ("CAA") to the Tennessee Valley Authority ("TVA"). EPA Administrator Carol M. Browner asked that the Environmental Appeals Board ("Board") reconsider the Compliance Order and issue the Agency's final decision on reconsideration.

TVA, an agency of the United States government, owns and operates eleven coal-fired electric power generating plants, many of which contain more than one generating unit. Most of TVA's power plants were built between the early 1950s and the early 1970s. The Region has alleged that TVA violated the CAA when it made certain changes to fourteen coal-fired electric power generating units at nine of TVA's plants without first obtaining preconstruction permits from either the EPA or, where applicable, the appropriate State or local agency. The projects took place between 1982 and 1996.

The CAA establishes two types of new source review ("NSR") preconstruction permitting programs relevant to this case: the prevention of significant deterioration ("PSD") program applicable in areas with air quality that is better than the national ambient air quality standards, and the nonattainment new source review ("nonattainment NSR") program applicable in areas with air quality that does not meet those standards. The PSD and nonattainment NSR permitting programs are run either by the EPA or, if a state has obtained EPA approval of a state implementation plan ("SIP"), by the applicable state or local agency. There is also a third type of preconstruction permitting program created pursuant to some of the state's SIPs, known as a minor NSR permitting program. In the present case, TVA's plants were, at various times, subject to the federal permitting regulations and at other times subject to SIP permitting programs run by the States of Alabama, Tennessee, and Kentucky and a local program run by the Memphis-Shelby County Air Pollution Control Board in Tennessee. The CAA's new source performance standards ("NSPS") requirements are also relevant to this proceeding.

The CAA's NSR permitting and NSPS requirements are intended to assure that major sources of air pollution use appropriate controls to limit the emission of pollutants into the atmosphere. All of TVA's coal-fired power plants at issue in this case were originally designed and built before the CAA was amended in 1977 to require persons

who own or operate certain facilities that are sources of pollutant emissions to obtain preconstruction permits.

Congress did not require existing pollution sources to install immediately the pollution controls the Act requires for new sources of air pollution. Instead, Congress provided that existing sources would become subject to the CAA's requirements when these sources are "modified." Thus, the term "modification" is a key term used in the CAA to identify whether a source must comply with one or more of the CAA's preconstruction permitting programs.

The central question presented is whether changes undertaken by TVA were "modifications" for which TVA was required to obtain preconstruction permits. (The term "modification" is also relevant for determining whether two of TVA's units became subject to the NSPS requirements as a result of the changes to those units.) As relevant here, the CAA definition of "modification" contains two primary parts: (1) there must be a *physical change* at an emissions source, and (2) the change must result in an *emissions increase* at that source.

The regulations EPA adopted to implement this statutory two-part test establish certain exclusions from what would otherwise be considered "physical changes." At the heart of the dispute in this case is an exception the regulations provide for "routine maintenance, repair and replacement." The regulations also establish detailed requirements concerning whether a physical change results in an emissions increase. There are generally different methods under the NSPS and the NSR programs for determining whether a change results in an emissions increase.

The Compliance Order alleged that TVA made "physical changes" to the fourteen coal-fired generating units and that those physical changes caused emissions increases for nitrogen oxides (NO_x), sulfur dioxide (SO_2), and particulate matter (PM) sufficient to trigger the applicable permitting requirements. TVA raised a variety of objections to the Compliance Order, including that the changes at issue fall within the exception for routine maintenance, repair and replacement and that the Agency's enforcement personnel prosecuting the case before the Board ("EPA Enforcement") failed to show that the changes caused emissions increases sufficient to trigger the permitting requirements.

HELD:

The Compliance Order is sustained in part and vacated in part. EPA Enforcement has abandoned or failed to prove roughly half of the allegations of the Compliance Order; those portions of the Compliance Order are vacated. EPA has, however, proved the remainder of the alleged violations. The Board thus finds at least one violation of the applicable PSD and nonattainment NSR standards at each of the TVA units referenced in the Compliance Order, with the exception of Widows Creek Unit 5. The Board's findings are summarized below.

1) With respect to whether TVA's projects were "physical changes" but nonetheless subject to the "routine maintenance, repair or replacement" exception under the NSR permitting programs:

a) EPA Enforcement has met its burden of establishing that each of the fourteen projects constitutes a physical change under the statute and applicable regulations. After reviewing the statutory goals, legislative history and case law regarding NSR, the Board finds that the four factor test EPA Enforcement advocates for determining whether a project falls within the routine maintenance, repair, and replacement exception is reasonable and consistent with the statute, regulations, and case law. The Board rejects, as inconsistent with the statute, regulations, and case law, TVA's interpretation of the routine maintenance, repair, and replacement exception. TVA's view of the breadth of the exception would swallow the rule that subjects existing sources to the requirement to install modern pollution controls when physical changes that increase emissions are made to these plants. (*See* Part III.C.1-. 2 of the Order)

b) Applying the four factor test (nature and extent, purpose, frequency, and cost) to the projects at issue, TVA has not met its burden of establishing that these projects are within the ambit of "routine maintenance, repair and replacement" and therefore exempt from NSR's permitting requirements. (*See* Part III.C.3 of the Order and Appendix A)

c) TVA's fair notice defense must fail because TVA has not established on the record in this case that the interpretation of the regulatory exception advocated by EPA Enforcement was not "ascertainably certain" from the regulation's text and its context. (*See* Part III.C.4 of the Order)

d) TVA's assertion that EPA has changed its interpretation of the exception without proper notice and comment rulemaking is also rejected. (*See id.*)

2) With respect to whether TVA's projects result in "significant net emissions increases" under the applicable NSR permitting programs:

a) The Board rejects TVA's argument that the NSR and NSPS programs must apply an identical emissions increase test, which looks to increases in the maximum hourly emissions rate of the source. (*See* Part III.D.3 of the Order)

b) The Board rejects EPA Enforcement's argument that, in calculating whether the change results in an emissions increase, the pre-change, or "baseline," emissions in this case should be the annual average emissions in the two years immediately preceding the physical change. EPA Enforcement failed to rebut TVA's proof that another baseline period is more representative in this case. That period is the two-year period within the five year period preceding the particular change in which emissions were highest. (*See* Part III.D.4 of the Order)

c) EPA Enforcement bases its allegations of NSR violations (other than SO_2 at Colbert Unit 5) upon an emissions increase test commonly referred to as the "actual-to-potential" test. That test compares the actual pre-change baseline to the maximum potential to emit of the unit if it were operated twenty-four hours a day for 365 days in a year. In the Compliance Order, however, the Region stated that actual pre-modification emissions are compared with "projected actual emissions" after the modification, in order to establish an NSR violation. Compliance Order ¶ 18. Given this clearly stated predicate in the Compliance Order, the Board finds that EPA Enforcement should not, on reconsideration, be permitted to substitute the more stringent actual-to-potential test. (*See* Part III.D.5.a of the Order)

d) The Board rejects TVA's argument that post-change emissions should be based upon post-change historical operating data. Because the statute and regulations contemplate that the regulated entity must predict future events in order to determine whether a permit is required, it is appropriate to base a finding of violation (for failure to obtain the permit) upon what the entity reasonably could have predicted prior to beginning construction. (*See* Part III.D.5.b of the Order)

e) Applying a projected actual emissions test and the representative baseline period, the Board concludes that EPA Enforcement has failed to show the requisite emissions increases for a number of the pollutants at some of the units for which it had requested a finding of violation. However, the Compliance Order must be sustained with respect to twenty remaining violations of the PSD and/or nonattainment NSR permitting requirements. This includes violations of at least one pollutant for each of the fourteen units, except for Widows Creek Unit 5. (*See* Part III.D.5.c of the Order)

3) With respect to the emissions increase requirement as applied under the NSPS program and the Alabama SIP nonattainment NSR provisions applicable prior to 1983, EPA Enforcement has demonstrated that the physical changes to TVA's Colbert Unit 5 both required a nonattainment NSR permit with respect to SO_2 emissions and triggered the NSPS requirements. (*See* Part III.E of the Order)

4) EPA Enforcement has demonstrated that TVA was in violation of the minor NSR permit requirements of the Alabama and Tennessee SIPs (including provisions pertaining to the Memphis-Shelby County Air Pollution Control Board), as alleged in the Compliance Order. (See Part III.F of the Order)

5) With respect to the Compliance Order's remedies for the violations identified above, section IV.1.(h) of the Compliance Order (regarding surrender of SO_2 allowances) is vacated as premature. The requirements that TVA submit schedules for it to come into compliance with the CAA with respect to the violations we have sustained, and, more generally, the requirements set forth in sections IV.1.(a) to (g) of the Compliance Order are sustained. The requirements that TVA apply for, and obtain, NSR permits for the units and pollutants as to which EPA Enforcement established a violation are also sustained. Notwithstanding provisions in the Compliance Order which may purport otherwise, the determination of what pollution controls will be required under the permits

must be made on a case-by-case basis by the applicable permitting authority. Such determinations must be consistent with the requirements in effect at the time of the permit applications. The portions of the Compliance Order requiring TVA to perform an audit of its coal-fired electrical generating units and remedy violations identified by the audit is sustained. (*See* Part III.G of the Order)

Before Environmental Appeals Judges Scott C. Fulton, Ronald L. McCallum, and Kathie A. Stein.

Opinion of the Board by Judge Stein:

This proceeding arises out of an administrative compliance order issued pursuant to sections 113 and 167 of the Clean Air Act ("CAA" or the "Act")[1] by John H. Hankinson, Regional Administrator for the United States Environmental Protection Agency ("U.S. EPA" or "Agency") Region IV (the "Region"), to the Tennessee Valley Authority ("TVA"). The administrative compliance order found that TVA had violated the CAA on numerous occasions when it made certain physical changes at TVA's coal-fired power plants that increased emissions of various pollutants. The Region amended the administrative compliance order several times, including a substantial amendment and restatement dated April 10, 2000 (the "Compliance Order").

This proceeding is before the Environmental Appeals Board ("Board") by delegation from U.S. Environmental Protection Agency Administrator Carol M. Browner ("Administrator"), who requested that the Board issue the Agency's final decision on reconsideration of the Compliance Order. Because the Regional Administrator issued the Compliance Order as an Agency order, its operative provisions are stated either as findings of violations or as actions required to be taken by TVA. However, since the Administrator has directed us to reconsider the Compliance Order, we will generally characterize the Compliance Order's findings as *allegations* that must be proven in order to prevail on

[1] 42 U.S.C. §§ 7413, 7477.

reconsideration, and the actions required by the Compliance Order as *requests* for relief. In addition, although the Region issued the Compliance Order, and thus it contains the Region's allegations, the Agency personnel arguing the case to the Board on behalf of the Region are from both the Region's enforcement office as well as from the Agency's Office of Enforcement and Compliance Assurance and Office of General Counsel, located in the Agency's headquarters. We will refer to such Agency personnel collectively as "EPA Enforcement."

For the reasons set forth below, we conclude that the Compliance Order must be sustained in part and vacated in part.

I. *INTRODUCTION*

This proceeding involves allegations by the Region that TVA violated the CAA when it made certain changes to nine of its coal-fired electric power generating plants without first obtaining preconstruction permits from either the EPA or, where applicable, the appropriate State or local agency. The CAA's permitting requirements are intended, among other things, to assure that pollution sources use appropriate controls to limit the emission of pollutants into the atmosphere. All of TVA's coal-fired power plants at issue in this proceeding were originally designed and built before the CAA was amended in 1977 to require persons who own or operate certain facilities that are sources of pollutant emissions to obtain preconstruction permits.

When Congress enacted the CAA in 1970, and subsequently when it amended the Act in 1977, Congress determined that existing pollution sources would be "grandfathered" – in other words, existing sources would not be required immediately to install the pollution controls the Act requires for new sources of air pollution. Congress, however, did not intend these sources to remain permanently exempt from the CAA's pollution control requirements. Instead, Congress provided that existing sources would become subject to the CAA's

requirements when these sources are "modified."[2] As explained by the Seventh Circuit, "[t]he purpose of the 'modification' rule is to ensure that pollution control measures are undertaken when they can be most effective, at the time of new or modified construction." *Wisconsin Elec. Power Co. v. Reilly*, 893 F.2d 901, 909 (7th Cir. 1990) (citation omitted) ("*WEPCO*"). By this structure of initially allowing grandfathering of existing sources but requiring those sources to comply with the CAA's pollution control requirements upon modification, Congress in effect balanced the competing concerns with regard to the inconvenience and cost of retrofitting existing plants with modern pollution controls and the harm to the nation's air quality from unabated air pollution.

Shortly after the enactment of the 1977 amendments to the CAA, the U.S. Circuit Court for the District of Columbia characterized the relationship between grandfathering and modification as follows:

> Implementation of the statute's definition of "modification" will undoubtedly prove inconvenient and costly to affected industries; but the clear language of the statute unavoidably imposes these costs except for de minimis increases. The statutory scheme intends to "grandfather" existing industries; but the provisions concerning modifications indicate that this is not to constitute a perpetual immunity from all standards under the PSD [prevention of significant deterioration] program.

Alabama Power Co. v. Costle, 636 F.2d 323, 400 (D.C. Cir. 1980) ("*Alabama Power*").[3] The Region's allegations that TVA violated the CAA when it made changes to nine of its coal-fired electric power generating plants without obtaining preconstruction permits requires us

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[2]The precise terms of the CAA are discussed below in Part III.B.

[3]The "PSD program" refers to one of the preconstruction permitting programs created by the CAA. The PSD program is implicated in this case and will be explained more fully below.

to decide whether those changes were "modifications" for which TVA was required to obtain preconstruction permits or, alternatively, whether the particular generating units remain "grandfathered" and thus exempt from these requirements. The answer to this question has great significance for the parties and the environment, for it determines whether or not TVA was required to install pollution control technology to minimize its emissions and comply with other requirements of the Act when it made changes to its plants.

The term "modification" is a key term used in the CAA to identify when a source owner or operator must comply with one or more of the preconstruction permitting programs created by the CAA. There are a wide array of preconstruction permitting programs that have been developed under the CAA's authority. The precise permitting requirements applicable to a particular project vary depending upon several factors, including which program applies, the air quality at the source's location, whether the permitting program is identical to the federal program or contains different provisions incorporated from state or local law, and the year in which any alleged changes were made. TVA's coal-fired electric power generating plants at issue in this case are located in the states of Alabama, Kentucky and Tennessee, and within the jurisdiction of one local permitting agency, Memphis/Shelby County, Tennessee. TVA made the alleged changes at its plants at different times between 1982 and 1996. A detailed discussion of the technical aspects of the requirements applicable to each of TVA's coal-fired units, and the changes made to those units, is provided below in Part III of this decision. Here, we provide a brief summary by way of introduction.

The rules that apply are those of EPA in effect at the applicable time, unless the State had obtained approval from EPA of its preconstruction permitting program prior to the particular change at issue, in which case the applicable rules are those of the State or local agency. Approved state programs are known as "state implementation plans" or "SIPs." The permitting requirements of the federal programs, as well as the permitting requirements of the Alabama, Kentucky, and Tennessee SIPs, are at issue in this case.

The types of required preconstruction permits generally fall into two categories, known as prevention of significant deterioration ("PSD") permits applicable in areas with air quality that is unclassifiable or is better than the national ambient air quality standards ("NAAQS"), and nonattainment new source review ("nonattainment NSR") permits applicable in areas with air quality that fails to meet the NAAQS. In the states involved in this case, a third type of permit may be required, known as a "minor" NSR permit, which applies in both attainment and nonattainment areas.

Although the specific requirements of the various NSR preconstruction permitting programs differ,[4] a number of general features are common to all programs. The determination under the various regulatory programs of whether the source owner or operator must obtain a permit before making a change to the source is derived from the statutory definition of the term "modification." Generally, the statutory standard requires consideration of two issues: (1) whether there was a "physical change" made to the unit, and (2) whether there was an increase in the emissions of particular pollutants that results from the physical change. The regulations for the various state and federal permitting programs interpret and elaborate upon the statutory definition of "modification" by both excluding certain types of changes from the permitting requirements and by establishing requirements for determining when the change results in an emissions increase. Of particular significance for this case, the regulations typically exclude "routine maintenance, repair, and replacement" from the permitting requirements.

As explained below, the Region alleges in the Compliance Order that TVA made "physical changes" to coal-fired generating units located at nine of its plants and that those physical changes resulted in emissions increases sufficient to trigger the applicable permitting requirements. The Compliance Order also alleges that none of the physical changes at issue fall within the exception for routine maintenance, repair, and

[4]New source review covers both new and modified sources, as discussed below.

replacement. TVA raises a variety of objections to the Compliance Order, including that the particular changes at issue fall within the exception for routine maintenance, repair, and replacement and that EPA Enforcement has failed to show that the changes resulted in emissions increases sufficient to trigger the permitting requirements. In evaluating the parties' arguments and in applying the technical requirements of the regulations to the facts of this case, we shall frequently refer to the observations of the U.S. Circuit Court for the District of Columbia in *Alabama Power* and the Seventh Circuit in *WEPCO* as noted above.

This decision will address the issues raised by the parties in the following order. We will begin by providing background information regarding projects that are at issue in this case (Part II.A). We will also briefly summarize the procedural history of this reconsideration proceeding (Part II.B). In order to provide context for our legal discussion in Part III, we begin our discussion with a brief summary of our decision (Part III.A). As will be discussed, this reconsideration process has provided TVA with an opportunity to be heard regarding the factual and legal bases for the Compliance Order. In the course of this process EPA Enforcement has abandoned a number of the allegations in the Compliance Order. In addition, we also determine, as discussed below, that EPA Enforcement has not proven a number of other alleged violations on the record of this case. In these respects, the Compliance Order must be vacated in part. In other respects, we find that EPA Enforcement has proven the alleged violations by a preponderance of the evidence and that the Compliance Order must be sustained.

In our substantive discussion of the legal issues that follows the summary of our decision, we will begin by providing a more detailed discussion of the relevant provisions of the CAA, with particular emphasis on the provisions authorizing state SIPs and the requirements for PSD and nonattainment NSR permitting programs, as well as the statutory definition of "modification" (Part III.B). Second, we will discuss the "physical change" requirement and TVA's arguments that the changes it made were within the scope of the "routine maintenance, repair, and replacement" exception (Part III.C). Third, we will discuss the applicable regulatory requirements for determining whether a

particular physical change has resulted in an increase in emissions of a particular pollutant (Part III.D).

Next, we will turn to the parties' arguments regarding whether the changes TVA made to one of the units, Colbert Unit 5, subject that unit to the requirements of the new source performance standard ("NSPS") program, a related pollution control program, and whether TVA operated Colbert Unit 5 in violation of the NSPS standard (Part III.E). Then we will consider whether TVA violated the "minor" NSR permitting requirements of the Alabama and Tennessee SIPs (Part III.F).[5] Finally, we will consider the parties' arguments regarding whether the relief required by the Compliance Order exceeds the Agency's authority under the CAA (Part III.G).

II. *BACKGROUND*

A. *TVA's Projects*

TVA is an agency of the United States Federal Government that was created by the Tennessee Valley Authority Act of 1933, as amended. 16 U.S.C. §§ 831-831dd. One of TVA's responsibilities is the generation, transmission, and sale of electrical power. TVA owns and operates a system that supplies power to approximately eight million people in an 80,000 square-mile area comprising portions of seven states.

TVA owns and operates eleven coal-fired electric power generating plants, many of which contain more than one generating unit. Most of TVA's power plants were built between the early 1950s and the early 1970s. Fourteen projects at nine of TVA's coal-fired power plants are at issue in this case. The particular power plants that are at issue, the date of their original construction, the generating units (identified by unit number) at such plants, and the dates of the alleged modification are as follows:

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[5]Although the Region originally alleged that the changes to TVA's Kentucky plants violated the Kentucky minor NSR permitting requirements, EPA Enforcement has abandoned those claims in its post-hearing briefs. *See infra* Part III.A.

- *Allen Plant Unit 3.* This unit is a 330-Megawatts ("MW") coal-fired steam boiler located in Shelby County, Tennessee, which commenced commercial operation in 1959. Construction of the alleged physical changes at Unit 3 that are at issue in this proceeding was commenced in late 1992 and completed in early 1993.

- *Paradise Units 1*, 2, and 3. Each of the Units 1 and 2 is a 770-MW coal-fired steam boiler located in Drakesboro, Kentucky, which began commercial operation in 1963. Construction of the alleged physical changes at Unit 1 that are at issue in this proceeding was commenced and completed in 1985. Construction of the physical changes at Unit 2 that are at issue in this proceeding was commenced in late 1985 and completed in early 1986. Paradise Unit 3 is a 1150-MW coal-fired steam boiler also located in Drakesboro, Kentucky. It began commercial operation in 1970. Construction of the alleged physical changes at Unit 3 that are at issue in this proceeding was commenced in late 1983 and completed in early 1985.

- *Bull Run Unit 1.* This unit is a 900-MW coal-fired steam boiler located near Clinton, Anderson County, Tennessee, which commenced commercial operation in 1967. Construction of the alleged physical changes that are at issue in this case was commenced and completed in 1988.

- *Colbert Unit 5.* This unit is a 500-MW coal-fired steam boiler located in Tuscumbia, Alabama. It began commercial operation in 1965. Construction of the alleged physical changes at Unit 5 that are at issue in this proceeding was commenced in February 1982 and completed in March 1983.

- *Cumberland Unit 1 and Unit 2*. Each unit is a 1300-MW coal-fired steam boiler located near Cumberland City, Tennessee, which commenced commercial operation in 1973. Construction of the alleged physical changes at Unit 1 that are at issue in this proceeding was commenced and completed in 1996. Construction of the alleged physical changes at Unit 2 that are at issue in this proceeding was commenced and completed in 1994.

- *John Sevier Unit 3*. This unit is a 135-MW coal-fired steam boiler located near Rogersville, Hawkins County, Tennessee. It began commercial operation in 1956. Construction on the alleged physical changes that are at issue in this proceeding was commenced and completed in 1986.

- *Kingston Unit 6 and Unit 8*. Each unit is a 200-MW coal-fired steam boiler located near Kingston, Roane County, Tennessee. Both units began commercial operation in 1955. Construction of the alleged physical changes at Unit 6 that are at issue in this proceeding was commenced and completed in 1989. Construction of the alleged physical changes at Unit 8 that are at issue in this proceeding was commenced in late 1989 and completed in early 1990.

- *Shawnee Unit 1 and Unit 4*. Each unit is a 175-MW coal-fired steam boiler located in McCracken County, Kentucky, which began commercial operation in 1953. Construction of the alleged physical changes at Unit 1 that are at issue in this proceeding was commenced in 1989 and completed in 1990. Construction of the alleged physical changes at Unit 4 that are at issue in this proceeding was commenced and completed in 1990.

- *Widows Creek Unit 5*. This unit is a 141-MW coal-fired steam boiler located in Jackson County, Alabama,

which began commercial operation in 1954. Construction of the alleged physical changes at issue in this proceeding was commenced in late 1989 and completed in early 1990.

B. *Procedural Background*

1. *The Issuance of the Compliance Order and Initial Consultation Between the Region and TVA*

The Region originally issued the Compliance Order on November 3, 1999.[6] The Region amended the Compliance Order several times, with a substantial amendment and restatement on April 10, 2000. The amendments to the Compliance Order made in April 2000 added more detailed findings, but did not change the central conclusion that TVA violated the CAA with respect to physical changes made to nine of its coal-fired electric power plants.

In particular, the Compliance Order, as amended, found that TVA violated the CAA when it made certain physical changes to fourteen of the boiler units at nine of its power plants without having first obtained permits under the CAA authorizing TVA to commence construction or modification of the plants. The Compliance Order found that TVA thus violated the CAA's PSD, nonattainment NSR, and NSPS requirements.

The Compliance Order also directed TVA to undertake certain actions to come into compliance with the CAA. In particular, the Compliance Order required TVA to undertake the following specific actions: (1) provide a detailed schedule for achieving compliance with all PSD and nonattainment NSR requirements; (2) provide a schedule for

[6]Prior to the issuance of the original Compliance Order, EPA Enforcement sent TVA a letter dated July 9, 1999, alleging that TVA had violated the CAA when it performed various replacement projects at its plants without the appropriate NSR permits. In this letter, EPA Enforcement requested a meeting with representatives of TVA to discuss these allegations. *See* TVA Response to Initial Brief, Ex. V.

achieving compliance with the NSPS for those units found to be in violation of those requirements; (3) enter into a Federal Facilities Compliance Agreement; (4) submit, to the appropriate federal, state, and local agencies, permit applications under the applicable NSR programs for those modifications made in violation of the CAA; (5) conduct an audit of each of its coal-fired plants identifying other physical changes made to those plants for which TVA was required to have permits but which were made without such permits; (6) provide a schedule for achieving compliance with respect to any additional violations identified in TVA's audit of its coal-fired plants; and (7) for any reductions in sulfur dioxide that result from pollution control equipment added pursuant to the Compliance Order, retire sulfur dioxide allowances equivalent to such reductions and be prohibited from using such reductions or selling them to any other utility.

After the Compliance Order was originally issued in November 1999, TVA requested a conference with Regional Administrator Hankinson, and a meeting was held on December 20, 1999. At that meeting, TVA submitted a brief (the "December 1999 Brief") describing its objections to the Compliance Order and requested that the Agency withdraw and reconsider the Compliance Order. Briefly, TVA argued that its projects were not "modifications" of the respective units on the ground that the particular physical changes were "routine maintenance, repair, and replacement" within the meaning of the applicable regulations, and it provided an extensive discussion of various statements attributed to EPA regarding the meaning of the phrase "routine maintenance, repair, and replacement." December 1999 Brief at 7-22. In its December 1999 Brief, TVA also argued that none of the physical changes made to its coal-fired plants resulted in a "significant net emissions increase." *Id.* at 23-31. Finally, TVA argued that the actions required of it by the original version of the Compliance Order are not authorized by the CAA. *Id.* at 32-35.

2. *Administrator's Delegation to the Board*

On May 4, 2000, the Administrator issued a memorandum to the Board ("Administrator's Memorandum") directing that the Board

conduct appropriate proceedings upon reconsideration of the Compliance Order, assuming that Regional Administrator Hankinson decided that the Compliance Order should be reconsidered.[7] The Administrator also requested that the Board issue a final decision on behalf of the Agency by September 15, 2000. The Administrator's Memorandum requested that EPA Enforcement and TVA be provided an opportunity to conduct limited discovery and provide limited oral testimony and that the administrative record be closed by August 1, 2000.

3. *Prehearing Orders by the Board*

By order dated May 15, 2000, the Board referred the prehearing and evidentiary hearing proceedings in this case to the Agency's Office of Administrative Law Judges. The Board's May 15 Order requested that the Administrative Law Judge assigned to the case present to the Board a complete record of the prehearing and evidentiary hearing proceedings by August 1, 2000. The May 15 Order also stated that, in conducting the prehearing and evidentiary hearing proceedings, the Administrative Law Judge was to look for guidance to the Consolidated Rules of Practice set forth at 40 C.F.R. part 22.[8] Thereafter the Chief Administrative Law Judge appointed Administrative Law Judge Andrew S. Pearlstein to preside over the prehearing and evidentiary hearing proceedings in this case.

The Board's May 15 Order also stated that the Board retained jurisdiction of this matter to conduct additional proceedings concurrently with the prehearing and evidentiary hearing proceedings discussed above. In particular, to facilitate the timely resolution of this matter, the

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[7]Regional Administrator Hankinson subsequently granted reconsideration by letter dated May 4, 2000.

[8]The Board's May 15 Order also stated that the Administrative Law Judge was not being requested as part of this referral to make, or recommend, findings of fact or conclusions of law at the conclusion of the hearing in this matter; rather, we stated that the Board would make findings as necessary and appropriate upon receipt from the Administrative Law Judge of the record of the proceeding.

Board directed that TVA and EPA Enforcement file briefs on certain issues, including briefs regarding the allocation of the burden of proof on the various claims and defenses asserted by the parties and briefs discussing the circumstances under which the law requires the owner or operator of a source to obtain (a) a PSD permit pursuant to 40 C.F.R. § 52.21, or pursuant to the applicable SIP, (b) a nonattainment NSR permit, and (c) a "minor NSR permit." The Board's Order also required EPA Enforcement to respond to various arguments made by TVA in its December 1999 Brief. After receiving briefs from the parties regarding allocation of the burdens of production and persuasion on the claims and defenses raised by the parties, in order to provide guidance to the parties during the evidentiary hearing the Board issued an order dated July 3, 2000, regarding the allocation of such burdens.

On May 17, 2000, TVA filed a motion seeking rescission of the Board's May 15 Order. In essence, TVA argued that the schedule set forth collectively in the Administrator's Memorandum, the May 15 Order and an order issued by Judge Pearlstein on May 17 did not provide TVA a full and fair opportunity to understand the allegations on which EPA Enforcement intended to focus in this proceeding and the basis for these allegations, and to test the rationale of EPA's allegations. EPA Enforcement opposed the motion. The Board denied that motion by order dated June 2, 2000, holding, *inter alia* that this proceeding is not a formal part 22 proceeding, that TVA is not entitled to discovery, and that the schedule in this proceeding has granted TVA significantly greater discovery and hearing rights than required by CAA § 113(a), 42 U.S.C. § 7413(a). By motion dated July 3, 2000, TVA renewed its motion to rescind on the grounds that events subsequent to June 2, 2000, demonstrated that this proceeding is "unfair" to TVA. After receiving a response from EPA Enforcement, the Board denied TVA's renewed motion to rescind by order dated July 7, 2000.[9]

[9]In our view, the material issues were developed sufficiently to allow for an informed decision on our part, and we do not believe that TVA has been prejudiced during this reconsideration process by the pace of the proceedings.

4. *Judge Pearlstein's Prehearing Orders*

On May 17, 2000, Judge Pearlstein entered an initial order governing the conduct of the prehearing and evidentiary hearing proceedings. Judge Pearlstein's May 17 Order, among other things, allowed the parties to begin discovery immediately "on a voluntary, cooperative basis * * * to the maximum extent possible," and it established a schedule for the parties to provide a prehearing information exchange of the type contemplated by 40 C.F.R. § 22.19. Judge Pearlstein's May 17 Order also scheduled a prehearing conference in early June 2000 and tentatively scheduled the evidentiary hearing on eight days in mid-July 2000.[10]

At the prehearing conference, which was held on June 7, 2000, in Knoxville, Tennessee, the parties agreed to a revised schedule for prehearing exchanges, a schedule for the parties to submit discovery disputes to Judge Pearlstein for resolution, and a schedule for the evidentiary hearing, providing for it to begin on July 11, 2000. Summary of Prehearing Conference (ALJ, June 9, 2000). Judge Pearlstein also

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[10]In addition, Judge Pearlstein's May 17 Order directed TVA to file an "answer" to the allegations of the Compliance Order, thereby treating the Compliance Order as functionally equivalent to a complaint for the purposes of framing the issues for the evidentiary hearing. In its answer to the Compliance Order, dated May 26, 2000, TVA asserted several affirmative defenses, including statute of limitations (TVA's Answer to EPA's Fourth Amended Order and Request for Information ("TVA Answer") ¶ 106), and failure on EPA Enforcement's part to issue an "adequate and reasonably intelligible Notice of Violation 30 days in advance of bringing this proceeding as required by 42 U.S.C. § 7413." TVA Answer ¶ 113. TVA did not reassert these two defenses in its post-hearing briefs and, for those reasons TVA appears to have abandoned them. In any event, neither defense is meritorious. By its terms, the statute of limitations at 28 U.S.C. § 2462 applies only to actions for fines and penalties. In this case, where the government is only seeking equitable or injunctive relief and not a penalty within the meaning of § 2462, the claims are not time limited. *See United States v. Telluride Co.*, 146 F.3d 1241, 1248 (10th Cir. 1998)*; United States v. Banks*, 115 F.3d 916, 919 (11th Cir. 1997), *cert. denied*, 522 U.S. 1075 (1998), *reh'g denied*, 523 U.S. 1041 (1998). Moreover, we have reviewed the notice of violation issued by EPA Enforcement to TVA on or about March 9, 2000, and are unpersuaded that it fails to comply with the statutory notice requirement set forth in CAA § 113(a), 42 U.S.C. § 7413(a).

stated, consistent with the Board's orders, that generally there is no right per se to discovery in Agency administrative proceedings and that any discovery disputes would be determined by the standards set forth in 40 C.F.R. § 22.19(e). *Id.* at 1.

During June, the parties submitted various discovery disputes to Judge Pearlstein concerning their requests for production of documents and interrogatories propounded to each other. On June 29, 2000, Judge Pearlstein issued an order, titled "Rulings and Guidelines on Discovery," in which he discussed the discovery disputes raised by the parties as of that date. In that order, Judge Pearlstein noted as follows:

> [A]s the parties are aware, the vast bulk of discovery in this case must be accomplished on a voluntary basis. The river of discovery is flowing and can only be slightly nudged to one side of the channel or the other by these rulings or guidelines.

Rulings and Guidelines on Discovery at 2. Judge Pearlstein also stated that "[i]t must also be remembered that this is a proceeding to reconsider an administrative compliance order. * * * This is not a federal court action or even a standard Part 22 administrative enforcement proceeding." *Id.* at 3. Judge Pearlstein observed that the parties would not have time in this proceeding to produce and review large volumes of documents and that "[t]he parties' resources would best be devoted to preparing their own cases and analyzing the actual evidence proposed by the opposing party as revealed in the prehearing exchange." *Id.* at 3-4.

In turning to the parties' arguments, Judge Pearlstein largely sustained EPA Enforcement's objections that TVA's document requests were "vague and likely to include an unreasonably large number of documents of little or no probative value." *Id.* at 4. Judge Pearlstein also held that "TVA has not shown generally that many of the categories

of documents it is seeking will have significant probative value on a disputed issue of material fact in this proceeding."[11] *Id.*

5. *The Evidentiary Hearing*

Judge Pearlstein began the evidentiary hearing on the morning of July 11, 2000, and completed the hearing in the evening of July 17, 2000. At the request of the Board, the evidentiary hearing was recorded on video tape as well as by transcript.[12] At the evidentiary hearing, EPA Enforcement called four witnesses and introduced more than 300 exhibits. Briefly, EPA Enforcement called the following four witnesses who testified regarding the following subjects:

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[11]Given the volume of relevant evidence in the record pertaining to each of the issues, we do not disagree with Judge Pearlstein's conclusions in this regard.

[12]On September 14, 2000, as the Board was completing this order, TVA filed an "Errata Sheet" regarding the transcript of the hearing in this matter (July 11 to 17, 2000). The Errata Sheet consists of twenty-four pages of changes that TVA apparently would like to have made to the transcript, accompanied by largely handwritten changes to the 1,105 page transcript. TVA, however, did not file a motion seeking approval of the suggested changes. We have previously stated that the Agency's Consolidated Rules of Practice, 40 C.F.R. Part 22, should be considered as guidance in the evidentiary hearing phases of this proceeding. May 15 Order at 2. Those rules provide that "[a]ny party may file a motion to conform the transcript to the actual testimony within 30 days after receipt of the transcript, or 45 days after the parties are notified of the availability of the transcript, whichever is sooner." 40 C.F.R. § 22.25. Under the guidance of this rule, we conclude that TVA's Errata Sheet must be rejected. TVA has made no showing that its submission is timely under the rule. (Moreover, we find that it is unreasonable for TVA to file its proposed Errata Sheet one day prior to the date on which a final decision was expected in this matter.) TVA also failed to file a motion seeking to conform the transcript to the "actual testimony." After reviewing relevant portions of the videotape, we find that several of TVA's suggested changes do not seek to conform the transcript to the actual testimony, but, remarkably, instead seek to add words or phrases that clearly were not spoken by the witnesses. *See, e.g.,* suggested changes to Tr. at 735, 766. Although, based on our preliminary review of TVA's proposed changes for purposes of determining whether to accept the substitutions, we have found nothing that would affect our decision, for the foregoing reasons, we reject this submission.

1. Joseph Van Gieson, who provided a general description of the boilers of coal-fired electrical power plants and air emissions analysis. Mr. Van Gieson also provided testimony regarding the operation and mechanics of coal-fired electric generating units and emissions estimation techniques and calculation of emissions from coal-fired power plants. Mr. Van Gieson prepared written testimony, which was submitted prior to the hearing and admitted into evidence at the hearing as EPA Enforcement Ex. 277.

2. Donald Randolph, who testified regarding his experience in various roles as a former employee and manager in TVA's maintenance department, including his experience with boiler maintenance projects at TVA. Mr. Randolph provided detailed testimony regarding the project at Widows Creek Unit 5. Mr. Randolph, who was subpoenaed to appear by EPA Enforcement, did not submit written testimony.

3. Michael J. Majoros, Jr., who testified regarding accounting rules applicable to public utility companies and classification of their assets and expenses. Mr. Majoros prepared written testimony, which was submitted prior to the hearing and admitted into evidence at the hearing as EPA Enforcement Ex. 280. In general, Mr. Majoros testified regarding the accounting records of the costs associated with the particular generating units at issue in this case and the accounting of the expenses associated with the fourteen physical changes at those units.

4. Alan Michael Hekking, who testified regarding maintenance of coal-fired electric power plants. Based on his experience as a former TVA plant manager, Mr. Hekking prepared written testimony, which was submitted prior to the hearing and admitted into evidence at the hearing as EPA Enforcement Ex. 279. Mr. Hekking also provided more detailed testimony regarding the reheater replacement project at Allen Unit 3.

At the evidentiary hearing, TVA called five witnesses and introduced thirteen exhibits including attachments. Briefly, TVA called the following witnesses who testified regarding the following subjects:

1. Jerry Golden, who testified about TVA's practices with respect to maintenance, repair, and replacement. Mr. Golden prepared written testimony, which was submitted prior to the hearing and admitted into evidence at hearing as TVA Ex. 4.

2. James Callahan, who testified on the accounting rules regarding the capitalization of plant-related expenditures and their implications under the CAA. Mr. Callahan prepared written testimony, which was submitted prior to the hearing and admitted into evidence at the hearing as TVA Ex. 6.

3. Gordon George Park, who testified regarding TVA's environmental compliance practices. Mr. Park prepared written testimony, which was submitted prior to the hearing and admitted into evidence at the hearing as TVA Ex. 5.

4. Donald Price Houston, who testified regarding the data and calculations of emissions at the nine units at issue. Mr. Houston prepared written testimony, which was submitted prior to the hearing and admitted into evidence at the hearing as TVA Ex. 9.

5. Joseph R. Bynum, who testified regarding TVA's power system, including load demand, TVA's overall maintenance philosophy, TVA's Fossil and Hydro Unit Evaluation and Modernization Program ("FHUEM") report and the implications to TVA if EPA's regulatory interpretation should apply. Mr. Bynum prepared written testimony, which was submitted prior to the hearing and admitted into evidence at the hearing as TVA Ex. 12.

On July 17, 2000, Judge Pearlstein concluded the hearing and sent the complete record to the Board for its decision on reconsideration.

6. *Filings Before the Board*

Pursuant to the Board's May 15 Order, the parties entered into and filed a comprehensive stipulation as to the air quality designation (as either attainment or nonattainment of the NAAQS) in the areas of TVA's

plants at the time of the various projects. *See* Joint Stipulations of Applicable Regulations and Attainment Status (August 2, 2000) ("Regulation Stipulation"). In the Regulation Stipulation, the parties also stipulated to the SIP provisions and federal regulations applicable during the relevant time periods. The parties attached copies of the SIP and federal regulation texts to the Regulation Stipulation in numbered tabs from 1 to 23. *Id.* Throughout this decision, we will generally refer to the Regulation Stipulation and the numbered tabs as citations for the relevant regulatory text.

Currently, the Board has before it EPA Enforcement's, TVA's, and non-parties Southern Alliance for Clean Energy and Natural Resource Defense Council's ("SACE/NRDC")[13] briefs on the merits of the Compliance Order, which total more than 600 pages in length. These briefs include: the Initial Brief of EPA Enforcement filed June 15, 2000 ("EPA Initial Brief"); Brief of the Tennessee Valley Authority in Response to the Initial Brief of EPA Enforcement, filed July 5, 2000 ("TVA Response to Initial Brief"); Post-Hearing Brief for SACE/NRDC, filed August 4, 2000; EPA Enforcement's Post-Trial Memorandum, filed August 4, 2000 ("EPA Enforcement Post-Hearing Brief"); Initial Post-Hearing Brief of the Tennessee Valley Authority, filed August 4, 2000 ("TVA Post-Hearing Brief"); EPA Enforcement's Post-Hearing Reply Brief, filed August 11, 2000 ("EPA Enforcement Reply Brief") and the Response Post-Hearing Brief of the Tennessee Valley Authority, filed August 11, 2000 ("TVA Reply Brief"). On July 31, 2000, Babcock and Wilcox Company, which is not a party in this matter, also filed a document entitled "Amicus Curiae Filing of the Babcock and Wilcox Company" without leave from the Board to do so.[14]

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[13]The Board granted SACE/NRDC the opportunity to submit non-party briefs, essentially as an amicus, under the rules generally applicable to Agency administrative enforcement proceedings. *See* Order Denying Motion to Intervene, Granting Leave to File Non-Party Briefs, and Scheduling Post-Hearing Briefing (EAB, June 16, 2000).

[14]EPA Enforcement objects to the Babcock & Wilcox filing on the grounds that it was not properly filed and that it contains mostly factual assertions that should have (continued...)

Additionally, TVA has filed with the Board two motions[15] to compel further discovery. *See* Motion of Tennessee Valley Authority to Compel Discovery, filed July 11, 2000 ("TVA's Motion to Compel Discovery"); Second Motion of the Tennessee Valley Authority to Compel Discovery, filed July 31, 2000 ("TVA's Second Motion to Compel Discovery"); and the Reply Memorandum in Support of Motion of Tennessee Valley Authority to Compel Discovery, filed July 31, 2000 ("TVA's Reply Memo Supporting Motion to Compel Discovery").

In these motions, TVA requests the Board to compel EPA Enforcement to "comply with the Discovery Order and to produce certain relevant documents." *See, e.g.*, TVA's Second Motion to Compel Discovery at 1. Further, in TVA's second motion to compel, TVA requests the Board to compel EPA Enforcement to produce additional documents because the documents EPA Enforcement produced through discovery revealed additional documents not produced and because EPA Enforcement raised additional claims at the hearing that were not included in the Compliance Order. *See id.* at 1. EPA Enforcement has responded to TVA's discovery motions. *See* EPA Enforcement's Response in Opposition to Tennessee Valley Authority's Motion to Compel Discovery, filed July 17, 2000 ("EPA Enforcement Response to Motion to Compel"); and EPA Enforcement's Response in Opposition to Tennessee Valley Authority's Second Motion to Compel Discovery and TVA's Reply Memorandum in Support of Its Motion to Compel Discovery, filed August 17, 2000 ("EPA Enforcement's Response to TVA's Second Motion to Compel Discovery"). Because we do not see

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[14](...continued)
been submitted into evidence at the hearing in order to allow an opportunity for cross examination. We find that Babcock & Wilcox filed this document without leave of the Board and failed to properly serve the parties. Additionally, the facts asserted in the document were facts that should have been introduced as evidence at hearing. *See* Order Denying TVA Motion to Rescind Scheduling Orders at 14 (EAB, June 2, 2000). Accordingly, we strike this filing from the record and will not consider it further.

[15]The first motion was submitted during the hearing, and Judge Pearlstein requested that the Board rule on it. The second motion was submitted after the close of the hearing.

the additional discovery sought by TVA as ultimately leading to the addition of evidence adding significant probative value to the substantial information already in the record relating to these issues, we deny both of TVA's motions to compel discovery.[16]

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[16]The Board denies both motions to compel further discovery for the following reasons. Initially, we note that the Compliance Order was issued pursuant to sections 113(a) and 167 of the CAA, 42 U.S.C. §§ 7413(a), 7477, which do not provide for any discovery. *See* Order Denying TVA Motion to Rescind Scheduling Orders (June 2, 2000). To the extent discovery has been allowed in this proceeding, we have used the standards set forth in 40 C.F.R. § 22.19(e) to guide the discovery process. *Id*. at 13.

The Board finds that EPA Enforcement has produced a large portion of the documents requested in TVA's motions to compel. In particular, EPA Enforcement has produced NSR determinations, including but not limited to those in the Agency's publically available "NSR Prevention of Significant Deterioration and Nonattainment Area Notebooks." With respect to those documents TVA requested that EPA has not produced, we find that TVA's motions to compel fall short of satisfying the provisions of 40 C.F.R. § 22.19(e), seek information that is largely cumulative of other information in the record, and reassert discovery disputes largely resolved by Judge Pearlstein in his Rulings and Guidelines on Discovery.

Specifically, TVA's motions do not address with enough specificity the requirement that such a motion for further discovery be granted only if it "seeks information that has significant probative value on the disputed issue of material fact relevant to liability or relief sought." *See* 40 C.F.R. § 22.19(e). TVA fails to identify the *significant probative value* of the documents requested, and, as Judge Pearlstein wrote in the order, we are unwilling to presume to which issues the documents relate. *See* Rulings and Guidelines on Discovery at 4.

Furthermore, the documents that TVA seeks are, for the most part, cumulative of the already extensive evidence in the record. As Judge Pearlstein observed, considerable discovery has taken place on a voluntary basis. In fact, EPA Enforcement states that it has produced approximately 135,000 pages to TVA. *See* EPA Enforcement's Motion to Compel Return of Privileged Documents (July 25, 2000). TVA has not shown how the documents sought are not otherwise cumulative.

Finally, TVA's motions also seek documents that go beyond Judge Pearlstein's Rulings and Guidelines on Discovery (e.g., state documents from states where no TVA plants are located). We accord significant deference to an Administrative Law Judge's discovery rulings, *In re Chempace Corp.*, FIFRA Appeal Nos. 99-2 & 99-3, slip op. at 24 (EAB, May 18,2000), 9 E.A.D. ___, and are unpersuaded by TVA's arguments for

(continued...)

EPA Enforcement has also filed a motion with the Board to compel the return of documents which EPA Enforcement alleges are privileged. *See* Motion to Compel the Return of Privileged Documents Inadvertently Produced (July 25, 2000) ("EPA Enforcement's Motion to Compel Return of Privileged Documents"); *see also* Reply Supporting Its Motion to Compel the Return of Privileged Documents Inadvertently Produced (Aug. 18, 2000) ("EPA Enforcement's Response to Motion to Compel Return of Privileged Documents"). TVA has responded to this motion by filing two briefs in opposition: Opposition of Tennessee Valley Authority to EPA Enforcement's Motion to Compel the Return of Privileged Documents Inadvertently Produced (July 31, 2000) ("TVA's Response to EPA Enforcement's Motion to Compel Return of Privileged Documents"), and Reply of Tennessee Valley Authority to EPA Enforcement's Motion to Compel the Return of Privileged Documents Inadvertently Produced (Aug. 31, 2000) ("TVA's Reply to EPA Enforcement's Motion to Compel Return of Privileged Documents").[17]

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[16](...continued)
additional discovery.

[17]EPA Enforcement requests that TVA be compelled to return six documents that allegedly were "inadvertently released" by EPA Enforcement to TVA during the course of discovery. Each of those six documents is an internal EPA memorandum related to inspections, enforcement reviews or other regulatory action with respect to power plants owned by Tampa Electric Company. As authority for its request, EPA Enforcement cites allegedly applicable case law regarding when a party waives its privilege as well as the "Protective Order," which was signed by both EPA Enforcement and TVA and then issued by Judge Pearlstein on July 6, 2000. In a subsequent pleading, EPA Enforcement states that four of the documents were not inadvertently released, but instead were "mistakenly" released. Reply Supporting Motion to Compel Return of Privileged Documents, at 4 n.4. In opposing EPA Enforcement's request, TVA argues that the Protective Order does not apply to EPA Enforcement's privilege claims and that, under applicable law, EPA Enforcement has waived any privilege.

Upon review we conclude that the Protective Order does govern whether the documents identified by EPA Enforcement are to be treated as confidential. The Protective Order applies to "Confidential Information," which is defined as documents or other information marked as confidential and which "a Party believes in good faith (continued...)

Finally, through EPA Enforcement's Post-Hearing Reply Brief, EPA Enforcement objected to several documents that TVA had attached to its post-hearing brief.[18] TVA responded to EPA Enforcement's objections in its August 17, 2000 filing, Tennessee Valley Authority's

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[17](...continued)
* * * is entitled to confidential treatment pursuant to 40 C.F.R. Part 2." Protective Order ¶ 2. Included among the types of information entitled to confidential treatment under Part 2 are "[i]nter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with an agency." 40 C.F.R. § 2.118(a)(5). Even if information has not been marked as confidential in the manner required by the Protective Order and has been inadvertently disclosed, such information may nonetheless be treated as Confidential Information pursuant to the procedures governing inadvertent disclosure identified in paragraph 10 of the Protective Order.

Applying these standards here, we conclude that five of the documents identified by EPA Enforcement in its Motion are not entitled to protection as Confidential Information under the terms of the Protective Order. Paragraph 10 only applies to "inadvertent or unintentional disclosure." EPA Enforcement has admitted that "[f]our of the six documents were intentionally released to TVA." Intentional release is, in our view, the opposite of inadvertent, and is the essence of a knowing waiver. EPA Enforcement has only identified the four intentionally released documents as "enforcement inspection reports at Tampa Electric Company ('TECO') facilities." Reply Supporting Motion to Compel Return of Privileged Documents at 4 n.4. Absent a better description of the four intentionally released documents, we rely upon TVA's statement that five of the six documents were found by TVA in a file titled "Region 4 TECO Inspection Reports." TVA's Opposition to Privilege Document Motion at 13. These five documents shall be treated as intentionally released and not entitled to treatment as Confidential Information under the Protective Order. As to the last document, bates range EPAOEC 049391 - 049406, EPA Enforcement has demonstrated that it was inadvertently disclosed and that it is the type of internal Agency memorandum entitled to confidential treatment under 40 C.F.R. Part 2. Therefore, this document is entitled to treatment as Confidential Information under the terms of the Protective Order and must not be disclosed by TVA, or its attorneys, to any third party.

[18]EPA Enforcement has objected to a number of tables and attachments that were included in TVA's Post-Hearing Brief, on the grounds that TVA submitted them after the close of the record on August 1, 2000. EPA Enforcement requests that the Board exclude those documents from the record. Although the documents were submitted after August 1, 2000, we find that the majority of the documents TVA included in its Post-Hearing Brief have little probative value to the case at hand and EPA Enforcement will not be prejudiced by these late submissions. Therefore, we will not exclude those documents from the record.

Response to EPA Enforcement's Objections Regarding the Scope of the Factual Record. For reasons stated in note 18, we deny EPA Enforcement's request to exclude those documents.

III. *DISCUSSION*

As noted above, the parties have raised a variety of legal and factual issues primarily relating to whether the changes made by TVA to its plants fall within the "routine maintenance, repair, and replacement" exception and whether those changes result in an emissions increase. In this part of our decision, we will discuss the issues raised by the parties and explain our conclusions. We begin by summarizing our conclusions.

A. *The Compliance Order Must Be Sustained in Part and Vacated in Part*

As discussed more fully below, based on the record of this reconsideration proceeding, we find that in a number of respects the Compliance Order cannot be sustained. In particular, EPA Enforcement has, during the course of this proceeding, abandoned certain allegations made in the Compliance Order. Moreover, as discussed below, we conclude that the record does not support a number of the allegations of increased emissions. On the other hand, in several important respects, we find that the Compliance Order must be sustained.

We reject TVA's primary defense – that all of the projects were undertaken as routine maintenance, repair, and replacement – for the reasons stated in Part III.C below. In summary, we conclude that EPA Enforcement has met its burden of establishing that each of the fourteen projects constitutes a physical change under the statute and applicable regulations. After reviewing the statutory goals, legislative history, and case law regarding NSR, the Board finds, as discussed below, that the four factor test EPA Enforcement advocates for determining whether a project falls within the routine maintenance, repair, and replacement exception is reasonable and consistent with the statute, regulations, and case law. Further, the Board rejects, as inconsistent with the statute, regulations, and case law, TVA's interpretation of the routine

maintenance, repair, and replacement exception. TVA's view of the breadth of the exception would, in our view, swallow the rule that subjects existing sources to the requirement to install modern pollution controls when physical changes that increase emissions are made to these plants.

We then apply the four factor test to the projects at issue to determine whether the projects are within the scope of the exception. In doing so, we find that TVA has not met its burden of establishing that these projects are within the ambit of "routine maintenance, repair, and replacement" and therefore exempt from NSR's permitting requirements. TVA has also raised a fair notice defense and an improper rulemaking defense to EPA Enforcement's use of its interpretation of routine maintenance, repair, and replacement. We find both defenses must fail for the reasons stated in Part III.C below. TVA has not established on the record in this case that the interpretation of the regulatory exception advocated by EPA Enforcement was not "ascertainably certain" from the regulation's text and its statutory context. TVA's assertion that EPA has changed its interpretation of the exception without proper notice and comment rulemaking likewise fails.

Although we reject TVA's primary defense, we nevertheless conclude, as discussed below, that the Compliance Order can be only partially sustained and must be vacated in a number of respects because of a lack of proof, particularly proof of increases of pollutant emissions. First, the Region alleged in the Compliance Order that, as a result of the changes made by TVA to Paradise Unit 3, TVA allegedly violated the NSPS. Compliance Order ¶¶ 95-98. In its Post-Hearing Brief, EPA Enforcement states that EPA Enforcement "is withdrawing the NSPS violation for Paradise Unit 3." EPA Enforcement Post-Hearing Brief at 163 n.102. Thus, the allegations regarding Paradise Unit 3's violation of the NSPS must be vacated.

Second, with respect to Colbert Unit 5, the Region alleged that TVA failed to comply with "the [NSPS] emission standards, testing, notification, record keeping, and reporting requirements." Compliance Order ¶ 102. However, EPA Enforcement introduced no evidence as to

whether the post-change emissions from Colbert Unit 5 exceeded the emissions standards of 40 C.F.R. part 60, subpart Da. Thus, the allegation that the operation of Colbert Unit 5 violated the emissions standard of the NSPS must be vacated.[19]

Third, the Compliance Order alleged that the changes made to each of the fourteen units at issue in this proceeding required a minor NSR permit from Alabama, Kentucky, Tennessee, or Memphis/Shelby County and that the failure to obtain such minor NSR permits violated the applicable state SIP. Compliance Order ¶¶ 50, 52, 60, 62, 70, 72, 74, 76, 78. In its Post-Hearing Brief, EPA Enforcement does not argue that any of the changes made to the units located in Kentucky (Paradise Units 1, 2 and 3, and Shawnee Units 1 and 4) violated the Kentucky minor NSR permitting requirements. *See* EPA Enforcement Post-Hearing Brief at 83-89. Accordingly, we conclude that EPA Enforcement has abandoned the allegations as to violation of the Kentucky minor NSR permitting requirements with respect to the changes made to these five units. Accordingly, in this respect the Compliance Order also must be vacated.[20]

Fourth, the Compliance Order alleged that each of the changes made to the fourteen units at issue resulted in a significant net emissions increase in the emissions of nitrogen oxides ("NO_X"), sulfur dioxide ("SO_2"), or particulate matter ("PM") requiring PSD and/or nonattainment NSR permitting. Compliance Order ¶¶ 50, 52, 60, 62, 70, 72, 74, 76, 78. In its Post-Hearing Brief, EPA Enforcement fails to argue that the changes to the following units resulted in a significant net emissions increase with respect to the following pollutants:

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[19]However, for the reasons discussed below in Part III.E, we conclude that the Compliance Order must be sustained with respect to the allegations that at Colbert Unit 5 TVA violated the NSPS requirements for testing, record keeping, and reporting.

[20]We discuss the allegations regarding violation of the Alabama, Tennessee, and Memphis/Shelby County minor NSR permitting requirements in Part III.F below and conclude that the allegations that TVA violated these requirements must be sustained.

Allan Unit 3 – PM
Cumberland Units 1 and 2 – SO_2
John Sevier Unit 3 – PM
Kingston Unit 6 – PM
Paradise Units 1, 2 and 3 – SO_2 and PM
Shawnee Units 1 and 4 – PM

See EPA Enforcement Post-Hearing Brief at 73-90. Accordingly, we conclude that EPA Enforcement has abandoned the allegations as to violations with respect to these pollutants at the identified units. To the extent that the Compliance Order intended to allege permitting violations with respect to all three pollutants at each unit, the Compliance Order cannot be sustained.

EPA Enforcement has, however, by virtue of the proof it has proffered, not abandoned the allegations of violations with respect to the following pollutants at the identified units (an "X" indicates that a finding of violation is requested with respect to the pollutant):

Chart No. 1

	NO_X	**SO_2**	**PM**
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	X
Colbert Unit 5	X	X	X
Cumberland Unit 1	X		X
Cumberland Unit 2	X		X
John Sevier Unit 3	X	X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	X

	NO_X	SO_2	PM
Paradise Unit 1	X		
Paradise Unit 2	X		
Paradise Unit 3	X		
Shawnee Unit 1	X	X	
Shawnee Unit 4	X	X	
Widows Creek Unit 5	X	X	X

EPA Enforcement Post-Hearing Brief at 73-90. In our discussion below, we will refer to this chart, which reflects twenty-nine alleged violations, as summarizing EPA Enforcement's requests for findings of violation.

As will be discussed below in Part III.D, EPA Enforcement bases its twenty-nine remaining requests for findings of NSR violations upon an emissions increase test commonly referred to as the "actual-to-potential" test, which compares actual pre-change emissions (based on the annual average emissions in a two-year baseline period) to the maximum potential to emit of the unit if it were operated twenty-four hours a day for 365 days in a year. EPA Enforcement bases its request for findings of violation on an actual baseline period that is the two years immediately preceding the changes made to each of the units. For the reasons stated in Part III.D.4, we conclude that the preponderance of the evidence in the record here establishes that another baseline period is more representative in this case -- the two-year period with the highest emissions within the five year period preceding the particular change, not the two years immediately preceding the changes. In Part III.D.5, we further note that in the Compliance Order the Region stated that actual premodification emissions are compared with "projected actual emissions" after the modification, in order to establish an NSR violation. Compliance Order ¶ 18. Therefore, we conclude that, given this clearly stated predicate in the Compliance Order, that EPA Enforcement should not, on reconsideration, be permitted to apply the actual-to-potential test.

In Part III.D.5, we explain why we conclude that a finding of violation for failure to obtain a preconstruction permit should be based upon what the source owner reasonably could have predicted prior to beginning construction. Applying a projected actual emissions test and the more representative baseline period, we conclude for the reasons stated in Part III.D.5.c that EPA Enforcement has failed to show the requisite emissions increases for a number of the pollutants at some of the units for which it had requested a finding of violation. For Widows Creek Unit 5, we find that EPA Enforcement has failed to show the requisite increase for any of the three identified pollutants. In total, considering all pollutants and units for which EPA Enforcement either abandoned the NSR claims made in the Compliance Order or failed to sustain its proof, the record does not support the Compliance Order's allegations with respect to twenty-one alleged violations, considering each pollutant at each unit as a separate violation. Accordingly, we are vacating these portions of the Compliance Order. However, we also find, as discussed below in Part III.D.5.c (and Part III.E, where SO_2 emissions from Colbert Unit 5 are discussed), that the Compliance Order must be sustained with respect to the twenty-one remaining violations of the PSD and/or nonattainment NSR permitting requirements. This includes violations of at least one pollutant for each of the fourteen units, except for Widows Creek Unit 5.

In summary, as discussed below, we find that EPA Enforcement has demonstrated that TVA violated the PSD and nonattainment NSR permitting requirements with respect to the following pollutants at the identified units:

Chart No.2

	NO_X	**SO_2**	**PM**
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	
Colbert Unit 5	X	X	X

	NO_X	SO_2	PM
Cumberland Unit 1	X		
Cumberland Unit 2	X		
John Sevier Unit 3		X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	
Paradise Unit 1	X		
Paradise Unit 2	X		
Paradise Unit 3	X		
Shawnee Unit 1	X	X	
Shawnee Unit 4	X	X	

We also find, as discussed below, that EPA Enforcement has demonstrated that TVA violated the minor NSR permitting requirements of the applicable state SIPs with respect to the following pollutants at the identified units:

Chart No. 3

	NO_X	SO_2	PM
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	X
Cumberland Unit 1	X		
Cumberland Unit 2	X		X

	NO_X	SO_2	PM
John Sevier Unit 3	X	X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	X
Colbert Unit 5	X	X	X
Widows Creek Unit 5	X	X	X

Next, we begin our analysis with a brief discussion of the statutory requirements of the Act.

B. *General Requirements of the Clean Air Act and Regulations*

Many of the principal issues raised by the parties in this case relate to the statutory definition of "modification," which, as we have said, defines when older pollution sources, including ones that were constructed before the CAA permitting requirements were enacted, become subject to the pollution control requirements of the NSR and NSPS programs. In this part, we will describe the general requirements of the CAA that are implicated in this case, with particular emphasis on the role of the term "modification" in those general requirements.

1. *The National Ambient Air Quality Standards*

The CAA is designed to protect and enhance the nation's air quality. CAA § 101(b)(1), 42 U.S.C. § 7401. The 1970 amendments to the CAA required the EPA to promulgate NAAQS to regulate the emission of certain pollutants into the atmosphere. The NAAQS are "maximum concentration 'ceilings'" for particular pollutants, "measured in terms of the total concentration of a pollutant in the atmosphere." *In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to 97-23, slip op. at 9 (EAB, Nov. 25, 1998), 8 E.A.D. ___. As noted above, the air quality of a particular area is expressed in terms of whether the area is classified

as "attainment," "unclassifiable," or "nonattainment" of the NAAQS for a particular pollutant. NAAQS have been set for six criteria pollutants: sulfur oxides,[21] particulate matter,[22] nitrogen dioxide ("NO_2"), carbon monoxide, ozone, and lead. *See* 40 C.F.R. §§ 50.4-.12.

In the present case, the parties have stipulated to the attainment classification for the areas where TVA's plants are located during the relevant time. *See* Regulation Stipulation at 5-6. Based on the Regulation Stipulation, it is undisputed that, during the time when construction was commenced on the physical changes that are at issue in this proceeding, the areas where the Cumberland Plant, the Bull Run Plant, the Kingston Plant, and the John Sevier Plant are located were designated as attainment for NO_2, SO_2, and TSP/PM_{10}. Regulation Stipulation at 6 ¶ 2. The Allen Plant is located in an area that was classified in 1992 (when construction was commenced on the changes at issue here) as nonattainment for ozone and attainment for NO_2, SO_2, and PM_{10}. Regulation Stipulation at 5-6 ¶ 1. The Colbert Plant is located in an area that was classified in the relevant time frame (1982) as nonattainment for SO_2 and attainment for NO_2 and TSP/PM_{10}. Regulation Stipulation at 6 ¶ 5. The Paradise Plant is located in an area that was classified in the relevant time frame (1985) as nonattainment for SO_2 and TSP and attainment for NO_2. Regulation Stipulation at 6 ¶ 3. The Widows Creek Plant is located in an area that was classified in the relevant time frame (1989) as nonattainment for SO_2 and attainment for NO_2 and TSP/PM_{10}. Regulation Stipulation at 6 ¶ 5. The Shawnee Plant is located in an area that was classified in the relevant time frame

[21]Sulfur oxides are to be measured in the air as SO_2. 40 C.F.R. § 50.4(c).

[22]In 1971, EPA promulgated primary and secondary NAAQS for particulate matter, measured as total suspended particulate matter, or "TSP." In 1987, EPA promulgated a NAAQS for PM designating particulate matter with an aerodynamic diameter less than 10 microns, or PM_{10}, as a criteria pollutant. Revisions to the National Ambient Air Quality Standards for Particulate Matter, 52 Fed. Reg. 52,634 (1987) (codified at 40 C.F.R. § 50.6). Thus, at different times NAAQS were measured as TSP and PM_{10}.

(1989 and 1990) as nonattainment for TSP and attainment for NO_2 and SO_2. Regulation Stipulation at 6 ¶ 4.

2. *The NSPS and NSR Statutory Requirements*

The CAA prescribes several general methods relevant to this proceeding for protecting and enhancing the nation's air quality, which, as discussed below, become applicable to a particular emissions source if it is "modified" within the meaning of the statute and applicable regulations. The CAA requires the EPA to promulgate NSPSs limiting emissions from sources of air pollution that EPA determines substantially contribute to the endangerment of public health or welfare. CAA § 111(b), 42 U.S.C. § 7411(b). NSPS are technology-based standards set at the emission rate that can be achieved by use of the best adequately demonstrated technology. CAA § 111(a)(1), 42 U.S.C. § 7411(a)(1). After the effective date of an NSPS, owners and operators of "any new source" are prohibited from operating the source in violation of the applicable NSPS. CAA § 111(e), 42 U.S.C. § 7411(e). "New source" is defined as "any source, the construction or *modification* of which is commenced after the publication of regulations * * * prescribing a standard of performance under this section which will be applicable to such source." CAA § 111(a)(2), 42 U.S.C. § 7411(a)(2) (emphasis added). EPA promulgated an NSPS for electric utility steam generating units, which by its terms became applicable to any source that is modified after September 18, 1978. 40 C.F.R. pt. 60, subpt. Da. Thus, if any of TVA's coal-fired steam generating units were "modified" within the meaning of the NSPS provisions on or after September 18, 1978, that unit was required to comply with the NSPS for electric utility steam generating units. As discussed below in Part III.E, EPA Enforcement argues that the changes made to Colbert Unit 5 in 1982-1983 were "modifications" that triggered the NSPS requirements. EPA Enforcement does not allege, in its Post-Hearing Brief, that any other projects triggered the NSPS requirements.[23]

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[23]The Compliance Order also alleged NSPS violations at Paradise Unit 3. As discussed above, EPA Enforcement abandoned those alleged violations in its Post-
(continued...)

In addition, the CAA, in Title I, parts C and D, requires that owners and operators of certain sources of air pollution must obtain permits before beginning "construction," including "modification," of existing pollution sources. This preconstruction permitting requirement is generally referred to as new source review, or NSR. Although the NSPS program is focused on technology requirements for source categories, the NSR requirements focus on the location of the source and its potential effect on the environment of that locality. *Northern Plains Resource Council v. EPA*, 645 F.2d 1349, 1356 (9th Cir. 1981).

There are several types of NSR permitting requirements at issue in this case. Whether a source owner must obtain one of these permits, and which of them must be obtained, depends generally on the amount of air pollution to be emitted from the unit as a result of the modification and the air quality of the area (based on whether the area has or has not attained the NAAQS) in which the source is located at the time of the project. The permitting requirements are pollutant-specific, which means that a facility may emit many air pollutants, but only one or a few may be subject to the permitting requirements. *In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. at 9 (EAB, Nov. 25, 1998), 8 E.A.D. ___.

The CAA requires EPA to establish two general types of NSR permitting programs. First, in order to prevent significant deterioration of air quality, the CAA establishes the PSD permitting program which governs preconstruction permitting in areas that are in "attainment" of the NAAQS or are "unclassifiable." *See* CAA §§ 160-169, 42 U.S.C. §§ 7470-7492. Second, the nonattainment NSR program governs preconstruction permitting in areas that are classified as not in attainment of the NAAQS. *See* CAA §§ 171-193, 42 U.S.C. §§ 7501-7515. Because the NAAQS are established on a pollutant specific basis and air quality is assessed with respect to each pollutant, it is possible that a source may be subject to both the PSD permitting requirements and the nonattainment NSR permitting requirements at a single facility if the

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[23](...continued)
Hearing Brief.

source is located in an area that is classified as "attainment" for some pollutants, but "nonattainment" with respect to other pollutants.

The CAA provides, with respect to both the PSD program and the nonattainment NSR program, that "modification" of a major stationary source of an air pollutant is unlawful unless the source owner or operator has obtained a preconstruction permit under the applicable PSD or nonattainment NSR program. CAA §§ 165(a), 169(2)(C), 171(4), 172(b) - (c), 42 U.S.C. §§ 7475(a), 7479(2)(C), 7501(4), 7502(b) - (c). Specifically, CAA section 165(a) prohibits "construction" of a facility without a permit, and section 169(2)(C) defines construction as including "modification" as defined in section 111(a) of the CAA.[24]

Before a permit is issued, among other things, the owner or operator of the source must demonstrate, *inter alia*, that post-modification emissions from the source will not violate air quality requirements. Specifically, the owner or operator must demonstrate that "emissions from * * * operation of such facility will not cause, or contribute to, air pollution in excess of [the NAAQS]," among other things. CAA § 165(a)(3), 42 U.S.C. § 7475(a)(3). Further, a permit may not be issued unless "there has been an analysis of any air quality impacts projected for the area as a result of growth associated with such facility." *Id.* § 165(a)(6), 42 U.S.C. § 7410.

3. *CAA's Requirement for SIPs (the State Programs)*

The CAA contemplates that states may exercise primary responsibility for creating plans to maintain and improve the nation's air quality consistent with the requirements of the CAA. Thus, the CAA calls for states to develop state implementation plans, or SIPs, that provide a plan for attainment of the NAAQs in nonattainment areas and

[24]Section 172(b)-(c) requires states to adopt SIPs for nonattainment areas that include provisions requiring permits for the construction of new or modified sources, and section 171(4) defines "modified" to have the same meaning as the definition of "modification" set forth in section 111(a).

for the prevention of significant deterioration in areas that are already in attainment or unclassifiable. *See* CAA § 110, 42 U.S.C. § 7410.

In particular, the CAA requires that a state's SIP must "include a program to provide for * * * regulation of the *modification* and construction of any stationary source within the areas covered by the plan" to assure that the NAAQS are achieved. CAA § 110(a)(2)(C), 42 U.S.C. § 7410(a)(2)(C), (emphasis added). Sections 110(a) and 161 of the CAA require states to adopt SIPs that contain emission limitations and such other measures as may be necessary to prevent significant deterioration of the air quality in areas that have been designated as "attainment" or "unclassifiable" with respect to the NAAQS. Sections 110(a) and 172 require states to adopt SIPs that, among other things, provide for attainment of the NAAQS in "nonattainment" areas. Thus, states are required to promulgate both PSD and nonattainment NSR permitting programs as part of their SIPs. The CAA also authorizes states to require a third type of permit, known as a minor source permit, which is applicable to all source modifications, whether located in attainment or nonattainment areas. CAA § 110(a)(2), 42 U.S.C. § 7410(a)(2).

Each state's SIP must set forth a permitting program that is at least as stringent as the requirements of the CAA. CAA § 110(a), 42 U.S.C. § 7410(a). EPA is charged with reviewing each state's proposed SIP and determining whether the SIP complies with the CAA's requirements. It must run federal permitting programs governing PSD and nonattainment NSR permitting in states that do not have an approved SIP. CAA § 110(c), (k), 42 U.S.C. § 7410(c), (k). EPA is also authorized to enforce the requirements of states' SIPs. *See* CAA § 113(a), 42 U.S.C. § 7413(a) (regarding, among other things, administrative orders to comply with SIPs).

In the present case, TVA's plants were, at various times, subject to the federal permitting regulations and at other times were subject to SIP permitting programs run by the States of Alabama, Tennessee, and Kentucky and a local program run by Memphis-Shelby County Air Pollution Control Board. Because this case involves fourteen projects

at nine power plants located in three states and the projects spanned a time period between 1982 and 1996, our discussion of the particular regulatory requirements at issue in this case will take into account the differences in the regulatory language in the different regulatory programs, the changes in those regulatory programs over time, and the changes over time in air quality of the plant locations (which resulted in changes in attainment classification in several areas for particular pollutants).[25]

4. *The Statutory Definition of "Modification"*

Although the particular language of the applicable regulatory program necessarily governs our determination of whether the alleged violations in fact occurred, the PSD, nonattainment NSR, and NSPS violations alleged in this case arise under the same operative language of the CAA: the definition of the term "modification," which, as noted, prescribes what construction activity must have a permit and what construction activity does not require a permit. This same definition of "modification" also defines when an existing source becomes subject to the NSPS requirements. CAA § 111(a)(2), 42 U.S.C. 7411(a)(2) (defining "new source" as "any stationary source, the construction or modification of which" is commenced after an identified date).

"Modification" for the purposes of the CAA's NSPS, SIP, PSD and nonattainment NSR requirements is defined in the statute as follows:

> The term "modification" means any physical change in, or change in the method of operation of, a stationary

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[25]In brief, the applicable state regulations are: Memphis-Shelby County Air Pollution Control Regulation art. I, div. IV, §§ 16-77, S1200-3-9-.01, 16-46, 16-47, §§ 16-48 (Regulation Stipulation tab 1); Rules of Tennessee Department of Public Health Bureau of Environmental Health Services Division of Air Pollution Control, ch. 1200-3-9-.01, rule 1200-3-2-.01 (Regulation Stipulation tabs 2-5); 401 Kentucky Air Regulations ("KAR") 51:050, 50:010, 51:017 (Regulation Stipulation tabs 6-8, 11-13); Alabama Department of Environmental Management ("ADEM") Regulation 16.4 (Regulation Stipulation tabs 14-15); ADEM Regulation 16.3.2 (Regulation Stipulation tab 15); ADEM Regulation 1.2 (Regulation Stipulation tab 21).

> source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.

CAA § 111(a)(4), 42 U.S.C. § 7411(a)(4). For our purposes, this definition contains two primary parts: (1) there must be a "physical change in * * * [a source]"[26] and (2) the change must "increase[] the amount of any air pollutant emitted [by such a source]." *WEPCO*, 893 F.2d at 907 (quoting 42 U.S.C. § 7411(a)(4)). Thus, the central issues in this case regarding the application of NSR and NSPS requirements relate to whether the projects were physical changes within the meaning of the CAA and the regulations promulgated thereunder, and whether such changes resulted in increases in the amount of air pollutant emissions.

The next part of our discussion will focus on the first of the statutorily-prescribed two part test. We will consider whether the projects undertaken by TVA at nine of its coal-fired electric power plants are "physical changes" within the meaning of the statutory definition and the exceptions adopted by the regulations that implement each of the programs.

C. *"Physical Change" and the NSR Exclusions for Routine Maintenance, Repair, and Replacement (Both State and Federal)*

In this part of our decision, we will focus on the statutory requirement of a "physical change," as interpreted and elaborated upon by the applicable PSD and nonattainment NSR regulations and the case law, and as applied to TVA's projects at issue. In so doing, we will review the regulations that trigger the permitting requirements and examine whether: (1) EPA Enforcement met its *prima facie* case of proving that a "physical change" occurred during each of the projects; and (2) whether TVA met its burden of proving that the routine

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[26]The statute also requires a permit before certain "operational changes" are made to a source. *See* CAA § 111, 42 U.S.C. § 7411. Because this case concerns "physical changes," however, our references to the statute will generally be limited to physical changes.

maintenance, repair, and replacement exception applies to the projects at issue in this case. Finally, we will consider TVA's arguments that EPA Enforcement's application of the rules to the TVA projects implicated by the Compliance Order presents fair notice concerns and represents an impermissible change in Agency interpretation.

1. *Was There a Physical Change?*

The initial element that EPA Enforcement must prove in its case is that each of TVA's fourteen projects at its nine plants did in fact constitute a "physical change" under the statute.[27] While this initial element is not seriously contested in this matter, it is worth noting the nature of the physical changes at the units in question.

In terms of what constitutes a "physical change" within the meaning of the CAA, the Seventh Circuit's holding in *WEPCO* is instructive. There, the court stated that "any physical change means precisely that." *WEPCO*, 893 F.2d at 909. In its decision, the court rejected Wisconsin Electric Power Company's argument that a "simple equipment replacement" did not constitute a physical change for the purpose of the CAA's modification provisions. Instead, the court gave the term "physical change" a broad construction:

> Thus, whether the replacement of air heaters and steam drums is a 'basic or fundamental change' in the Port Washington plant is irrelevant for our purposes, given

[27]In the instant case, the units that are the subject of the Compliance Order have at various times been regulated under a SIP or the federal regulations that apply in the absence of SIP coverage. *See* Regulation Stipulation. In both the federal regulations for NSR and the SIPs for Alabama, Tennessee, and Kentucky, as well as Memphis-Shelby County's local program, the relevant regulatory definitions for "modification," "major modification," and "routine maintenance, repair, and replacement" are substantially the same. Thus, for simplicity, the Board will refer to the federal regulations as representative of all like formulations in its discussion of "physical change." The Board's use of the federal regulations is also consistent with the parties' briefs on this matter. Throughout this reconsideration process, both parties have focused on the federal regulatory language for this first part of the test.

> Congress's directions on the subject: 'The term modification means any physical change * * *.' 42 U.S.C. § 7411(a)(4). We follow Congress's definition of 'modification' -- not Webster's -- when interpreting this term within the context of the Clean Air Act.

Id. at 907 (citation omitted). In each of the fourteen projects TVA replaced or upgraded substantial boiler components. These components included: horizontal reheaters, economizers, superheaters, secondary superheaters, furnaces, waterwalls, and cyclones. Each project involved the replacement of thousands of feet of tubing. *See* EPA Enforcement Exs. 202-215; 273, *Id*. Ex. 279 (Hekking's pre-filed testimony); TVA Ex. 4 (Golden's pre-filed testimony). Recognizing the breadth of the phrase "physical change," TVA's replacement of various boiler components and elements clearly constituted physical changes within the meaning of the CAA.

2. *Were the Physical Changes Covered by the Routine Maintenance, Repair, and Replacement Exception?*

The regulatory provisions pertaining to physical changes provide a limited number of exceptions to the major modification definition. In this case, TVA has argued that one of these exceptions is applicable to all fourteen projects at issue here. That exception, known generally as the "routine maintenance exception,"[28] provides:

> A physical change or change in the method of operation shall not include: (a) Routine maintenance, repair, and replacement * * *.

40 C.F.R. §§ 51.165(a)(1)(v)(C), .166(b)(2)(iii), 52.21(b)(2)(iii).[29] This

[28]For ease of reference, we will generally use this phrase to refer to the routine maintenance, repair, and replacement exception.

[29]*See supra* note 25.

exception is not found in the statute, but rather is a creature of regulation, promulgated as part of EPA's NSR regulations in 1978.[30] Thus, the second step in our analysis is to consider whether, notwithstanding the presence of physical changes, TVA can demonstrate[31] that the physical changes were not subject to NSR because they were excepted as "routine maintenance, repair, and replacement." Although the regulations themselves do not elaborate further on the meaning of the phrase "routine maintenance, repair, and replacement," EPA provided the following guidance in the preamble to its 1992 amendment to the NSR regulations:

> [The] determination of whether the repair or replacement of a particular item of equipment is 'routine' under the NSR regulations, while made on a case-by-case basis, must be based on the evaluation of whether that type of equipment has been repaired or replaced by sources within the relevant industrial category.

57 Fed. Reg. 32,314, 32,326 (1992).

TVA and EPA Enforcement differ regarding the proper interpretation of this exception. In considering this interpretive dispute, we look first to the statute itself and its goals. *See Auer v. Robbins*, 519

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[30]The exception originated through the NSPS program, which also includes a similar, but not identical, routine maintenance, repair, and replacement exception. 40 C.F.R. § 60.14(e). "The following shall not be considered modifications under this part: (1) Maintenance, repair, and replacement which the Administrator determines to be routine for a source category, subject to the provisions of paragraph (c) of this section and § 60.15." 40 C.F.R. § 60.14(e)(1). This NSPS exception, as applicable to Colbert Unit 5, will be discussed below in Part III.E.

[31]The Board has previously held in its July 3, 2000 Order Regarding the Scope of the Record, the Standard of Review, and Allocation of the Burden of Proof that the routine maintenance exception is an affirmative defense which TVA must raise and with respect to which TVA bears the burdens of production and persuasion. *See* July 3, 2000 Order at 25.

U.S. 452 (1997); *North Haven Board of Ed. v. Bell*, 456 U.S. 512(1982); *Georgia v. Shalala*, 8 F.3d 1565 (11th Cir. 1993); *O'Neal v. Barrow County Bd. of Comm'rs*, 980 F.2d 674 (11th Cir. 1993). A major goal of the CAA was to create a program that was technology forcing and that increased the use of air pollution control technology over time. "The Clean Air Amendments were enacted to 'speed up, expand, and intensify the war against air pollution in the United States with a view to assuring that the air we breathe throughout the Nation is wholesome once again.'" *WEPCO*, 893 F.2d at 909 (quoting H.R. Rep. No. 91-1146, at 1, *reprinted in* 1970 U.S.C.C.A.N. 5356).

In keeping with this objective, the program Congress established was particularly aggressive in its pursuit of state-of-the-art technology at newly constructed sources. At these sources, pollution control methods could be efficiently and cost-effectively engineered into plants at the time of construction. *See* H.R. Rep. No. 95-294, at 185, *reprinted in* 1977 U.S.C.C.A.N. at 1264 ("Building control technology into new plants at time of construction will plainly be less costly then [sic] requiring retrofit"). It was in view of the economic and practical difficulties of retrofitting older, existing plants with modern pollution control devices that Congress in effect "grandfathered" these sources, including the TVA facilities at issue here, from the duty to modernize pollution control.

As the courts have observed, the structure of the Act reflects that this grandfathering was envisioned as a temporary rather than permanent status, in that existing plants were required to modernize air pollution controls whenever they were modified in a way that increased emissions. *WEPCO*, 893 F.2d at 909 ("But Congress did not permanently exempt existing plants from these requirements; section 7411(a)(2) provides that existing plants that have been modified are subject to the Clean Air Act programs at issue here."). Given that existing sources necessarily deteriorate in performance over time, they ultimately must either shutdown or undergo major overhauls to extend their productive life. Since, in the latter case, such major overhauls would often be subject to the requirement to modernize pollution controls, ultimately the environmental protection goals of the CAA would be realized at the vast

majority of major sources of air pollution. *See WEPCO,* 893 F.2d at 909 ("The purpose of the modification rule is to ensure that pollution control measures are undertaken when they can be most effective, at the time of new or modified construction.")*; Alabama Power*, 636 F.2d at 400 (The statutory scheme intends to `grandfather' existing industries; but the provisions concerning modifications indicate that this is not to constitute a perpetual immunity from all standards under the PSD program. If these plants increase pollution, they will generally need a permit.").

We find additional instruction in the case law pertaining to construction of exceptions. Generally, where, as here, an exclusion is created by regulation, and where the statute does not explicitly contemplate such an exclusion, the exclusion will be narrowly construed. *See O'Neal v. Barrow County Bd. of Comm'rs*, 980 F.2d 674 (11th Cir. 1993); *see also North Haven Bd. of Educ. v. Bell*, 456 U.S. 512 (1982). Consistent with this principle of construction, the court in *Alabama Power* found that EPA's authority to exempt sources from the statutory definition of "modification" is limited to "de minimis [activity] or administrative necessity."[32] *Alabama Power*, 636 F.2d at 400. The regulatory exceptions to "physical change" promulgated by the Agency in the wake of *WEPCO* generally reflect this limiting constraint.[33] Indeed, EPA has been mindful of this constraint:

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[32]In *Alabama Power*, the court remanded to EPA the Agency's original definition of major modification. The original definition of a major modification included the requirement that the potential emission rate increase by either 100 tons per year or more for any source category identified in the Act (42 U.S.C. § 7479(1)), or by 250 tons per year or more for any stationary source. The court found that EPA had not justified this exemption to the Act of de minimis or administrative necessity and, therefore, struck that portion of the definition. *Alabama Power*, 636 F.2d at 400.

[33]Examples of other exceptions to "physical change" include: use of an alternative fuel by reason of an order or rule under section 125 of the Act; use of an alternative fuel at a steam generating unit to the extent that the fuel is generated from municipal solid waste; and any change in ownership at a stationary source. *See generally*, 40 C.F.R. §§ 51.165(a)(1)(v)(C), .166(b)(2)(iii), 52.21(b)(2)(iii).

> The EPA has always recognized that the definition of physical or operational change in section 111(a)(4) could, standing alone, encompass the most mundane activities at an industrial facility (even the repair or replacement of a single leaky pipe, or a change in the way that pipe is utilized). However, EPA has always recognized that Congress obviously did not intend to make every activity at a source subject to new source requirements.

57 Fed. Reg. 32,314, 32,316 (1992).

The interpretive inquiry at hand cannot be divorced from this statutory and regulatory backdrop; rather, it should be fundamentally informed by it. We turn now to the parties' specific contentions regarding how the routine maintenance exception should be construed in the context of this case. For its part, EPA Enforcement argues that the exclusion requires:

> a case-by-case determination by weighing [1] the nature [and] extent, [2] purpose, [3] frequency, and [4] cost of the work, as well as other relevant factors, to arrive at a common-sense finding.

EPA Enforcement Initial Brief at 24.[34] As support for its position, EPA Enforcement directs the Board to the Seventh Circuit's discussion of the routine maintenance exception in *WEPCO.* In *WEPCO*, the court

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[34]EPA Enforcement's articulation of the test is essentially the same as that articulated in internal Agency guidance from over a decade ago. *See* Memorandum from Don R. Clay, Acting Assistant Administrator for Air and Radiation, U.S. EPA, to David A. Kee, Director of Air an Radiation Division, Region V (Sept. 9, 1988) ("Clay Memorandum"). The Clay Memorandum was cited by the Seventh Circuit in its 1990 decision. *WEPCO,* 893 F.2d at 906.

unquestionably applied the four factor test[35] proposed here by EPA Enforcement in concluding that the particular project under review fell outside the routine maintenance exception. *WEPCO*, 893 F.2d at 910-12.

TVA does not so much take issue with the four factor test advanced by EPA Enforcement and embraced by the court in *WEPCO*, but rather argues that the predominant consideration in applying the four factor test is whether the activity is "common within a relevant source category." TVA Reply Brief at 23. In support of this view, TVA cites, among other things, the preamble to the 1992 amendments to the NSR regulations, which states:

> [W]hether the repair or replacement of a particular item of equipment is "routine" under the NSR regulations, while made on a case-by-case basis, must be based on the evaluation of whether that type of equipment has been repaired or replaced by sources within the relevant industrial category.

57 Fed. Reg. at 32,326 (1992). Thus, in determining whether a project is "routine," TVA's approach looks first to industry practice to determine whether the activity has been undertaken elsewhere. If it has, then, in TVA's view, it should be regarded as routine.

EPA Enforcement acknowledges that the determination of what is routine is necessarily informed by the context of the industry within which a facility operates, *see* EPA Enforcement Initial Brief at 29, but argues that the fact that a number of facilities within an industry may have undertaken a project which would be viewed as significant in the life of any individual facility does not render such a project "routine" within the meaning of the exception. Rather, according to EPA

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[35]In referencing the test as "the four factor test," we do not intend to discount the possible significance in a given case of the catch-all phrase, "as well as other relevant factors." In this case, however, the evidence fairly neatly arrays itself under the four main factors, thus making it unnecessary to give special consideration to other relevant factors.

Enforcement, routineness should be determined according to a broader range of considerations, including, most notably, the significance of the project in the life of the unit in question. Thus, in EPA Enforcement's view, an activity is more likely to be regarded as routine if it is not unusual in the life of a given unit.

TVA's argument ultimately cannot bear scrutiny when set against the structure and objectives of the CAA and the NSR program. As TVA's analysis of the coal-fired utility industry suggests, the coal-fired utility industry is replete with older plants that, to remain productive, have required significant overhauls.[36] The reference group to which TVA points is thus one in which a significant number of projects have been undertaken to restore and extend plants' productive lives. If TVA can, under cover of routine maintenance, repair, and replacement, undertake significant, emissions-increasing overhauls of its existing facilities without modernizing pollution controls simply because others in the industry have undertaken like projects, then the CAA's grandfathering of TVA's units in 1977 becomes, in effect, a permanent status. In that event, the natural and efficient occasions that Congress and the courts anticipated for installing modern pollution control equipment, such as where operations are suspended for purposes of reconstructing related equipment, are forfeited.

Given the extent of rehabilitation efforts in TVA's reference group, TVA's construction of the exception would, carried to its logical conclusion, allow TVA to rebuild an entire facility without triggering new source review so long as it did so in increments that can be identified elsewhere in the industry. Indeed, there is evidence that this was an important part of TVA's design. For example, in 1984, a TVA official made the following statement in notes which he typed and submitted to his supervisor after attending an industry life-extension conference. *See* Tr. at 700.

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[36]At the hearing, as noted *infra*, TVA introduced evidence concerning frequency of boiler component replacements throughout the utility industry.

> One statement concerning environmental regulations will need to be kept in mind if massive unit rehab projects are undertaken. If modifications proposed are extensive enough to be considered reconstruction, EPA might try to apply the new source performance standards. *This could erase one major advantage of life extension over new plant construction.*[37]

See EPA Enforcement Ex. 139, at 8922750 (Notes from C.F. Dye, Project Manager, Plant Life Extension, Bull Run Steam Plant, to C.N. Dammann, Assistant Director of Fossil and Hydro Power (June 4, 1984)) (emphasis added). This appears to be the kind of "end run" on new source review that concerned the D.C. Circuit in *Alabama Power*, *see* 636 F.2d at 400 (Congress did not intend that there be "perpetual immunity from all standards under the PSD program"), and that informed the court's conclusion in *WEPCO*.[38] Accepting TVA's view risks allowing routine maintenance, repair, and replacement to become the exception that swallows the rule that otherwise requires upgrading of pollution control equipment during modification events. Such an outcome simply cannot be reconciled with the objectives of the CAA.[39]

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[37]Although this note refers to reconstruction issues under NSPS, *see* 40 C.F.R. § 60.15, it is nevertheless instructive as to TVA's overall orientation to new source issues.

[38]In *WEPCO*, the court approved of EPA's conclusion that if the "purpose is to completely rehabilitate aging power generation units whose capacity has significantly deteriorated over a period of years, thereby restoring their original capacity and substantially extending the period of their utilization as an alternative to retiring them as they approach the end of their life, then the change is not routine." *WEPCO*, 893 F.2d at 911.

[39]Where actions in one part of an industry would serve to *categorically* exempt like activities elsewhere in the industry, TVA's argument would also appear to represent a departure from a true *case-by-case* review, as contemplated by Agency guidance and the *WEPCO* decision. Indeed, under TVA's approach, it is questionable whether, in view of the extensive work undertaken within the industry even before promulgation of the 1977 NSR regulations, all of which can be consulted as proof of industry practice, the (continued...)

See WEPCO, 893 F.2d at 909 (the CAA should not be construed in a manner that would "open vistas of indefinite immunity from the provisions of NSPS and PSD").

TVA's citation to the 1992 preamble and the 1975 NSPS regulatory exclusion cannot serve to resuscitate its interpretation. First, the 1975 NSPS regulations are not applicable to the PSD and nonattainment NSR permitting requirements and, thus, are not relevant in this context.[40] Second, the language in the 1992 preamble merely explains that in determining whether an activity is "routine," the applicability of the exclusion must be assessed in the context of the particular industry in which the activity is planned. Indeed, the frequency with which certain kinds of activities have been undertaken at another comparable plant can be instructive in determining whether, for example, an activity never before undertaken, or seldom undertaken, at a unit under review should be regarded as "routine." But it is the frequency of the activity at other *individual* units within the industry that seems to us most relevant in this context. The mere fact that a number of different facilities within an industry may have undertaken these projects strikes us as much less instructive with respect to whether a project under review should be considered "routine," than the observation that this kind of replacement is, for an individual unit, an unusual or once or twice-in-a-lifetime occurrence. Further, we find nothing in the 1992 preamble passage that supports TVA's view that such information should be treated as dispositive of routineness.

Notably, in *WEPCO*, the fact that the project had never been done by another entity in the industry was certainly a factor the court referenced. However, the court did not stop its analysis there. Rather,

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[39](...continued)
modification program would have had any meaningful practical effect.

[40]The NSPS exclusion for routine maintenance, repair, and replacement differs from the NSR exclusion in that the NSPS regulation includes language requiring a determination from the Administrator before the exclusion applies. *See supra* note 30; *infra* Part III.E.

the court cited additional facts as significant in its finding the project to be non-routine, including, "the renovation work items * * * are those that would normally occur only once or twice during *a unit's* expected life cycle." *WEPCO*, 893 F.2d at 912 (emphasis added).

Thus, in our view, the approach advocated by EPA Enforcement more reasonably implements the statutory objectives and the regulatory text in question. *See Fluor v. OSHA*, 861 F.2d 936, 941 (6th Cir. 1988) ("[T]he Commission's interpretation of the regulation better serves the remedial purposes of the [Act].") Unlike TVA's construction, which tends to elevate a single consideration – the occurrence of an activity anywhere else within an industry – above all others, EPA Enforcement's approach examines the full range of considerations contemplated by the four factor test historically embraced by the Agency and adopted by the court in *WEPCO*.

We further find this articulation more consonant with the principle, discussed above, that the exclusion be *narrowly* construed in light of the statutory intent, regulatory construction, and prior case law, including, most notably, the requirement that any regulatory exemption be applied to exclude only "de minimis" activity or for "administrative necessity." *Alabama Power*, 636 F.2d at 400.

We move now to the application of the four factor test to the projects addressed by EPA Enforcement's Compliance Order to determine whether TVA has met its burden of showing that they are routine. To provide context, we first consider a number of preliminary matters, including background information on the nature of facilities affected by the projects at issue, and information regarding TVA's organizational structure and accounting practices that bears on the question of routineness.

3. Application of Routine Maintenance Exception to TVA's Projects

a. Description of the Coal-fired Production of Electricity

The fourteen projects at issue in this case deal mainly with the boilers in nine of TVA's coal-fired plants. Accordingly, some background regarding how the utility industry uses boilers in the generation of electricity and a more detailed description of a typical boiler unit is helpful before discussing the particular changes TVA made to the units at issue in this case.

Each plant that uses coal in the production of electricity has three main sections used to convert the energy from coal into electrical energy: (1) the boiler, (2) the steam turbine, and (3) the electric generator. Tr. at 52. Each of these sections of the plant is used in one stage of the conversion from coal to electricity. The boiler performs two main functions in this process. This is where (1) coal is combusted and the coal's energy is released in the form of heat and light and (2) heat energy is converted into steam energy. The steam is then directed to the turbine where it is further converted to mechanical energy in the form of a spinning turbine shaft, which in turn drives the generator that produces the electricity. Tr. at 53.

Boilers range in size from a few stories to twelve stories high. Tr. at 54. In general, a boiler is constructed of miles of tubing or piping. Tr. at 53. The walls, roof, and floor are comprised of pipes or tubes, as are the other major components in a boiler. The latter components are suspended within the boiler unit itself and include, for example, the economizer, reheater, primary reheater, primary superheater, secondary superheater, and secondary reheater. Additionally, burners are attached

to the boiler. TVA uses cyclone burners[41] at many of its units. The number of burners at a boiler depends on the size of the boiler.

The combustion process generally works as follows. After the coal is ground to the appropriate size for the burners, air suspends the particles and transports them to the burners. Once the coal is ignited in the furnace, it releases energy, gas by-products, and particulate matter or PM. The gases are collectively referred to as the flue gas.[42]

The various components of the boiler are involved in the absorption process which transfers the heat energy of the coal to steam. The tubes or pipes which form the walls of the boiler are called waterwalls and contain mostly water. The components that are suspended inside the boiler contain mostly steam. The hot gases travel between the pipes that make up these components so that heat energy is absorbed from the flue gases and transferred to the steam contained inside the pipes. Although the exact position of these components varies from one boiler to the next, they function in largely the same manner in all boilers. In short, these components allow the transfer of heat energy from the combusted coal to the steam in the piping.

Because the pipes that comprise the waterwalls and suspended components are in constant contact with the flue gas and/or combusting coal, those pipes are subject to deterioration over the life of the boiler and may develop leaks and require repair, or replacement. As will be discussed below, the projects at issue in this case do not involve the replacement or repair, of an occasional or isolated broken or ruptured pipe, but instead involve the replacement of multiple components, each

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[41]TVA uses cyclone burners at many of its units. The burners are attached to the boiler and are used in the coal combustion process.

[42]The gases produced from the combustion process form carbon dioxide, carbon monoxide, SO_2, and NO_X. Tr. at 63. The flue gases flow through the upper sections of the boiler and exit to the air preheater and then generally to an air pollution control device. From the pollution control equipment the gas enters an induced draft fan, then out the stack and is emitted into the atmosphere. Tr. at 64-65.

of which consists of tens of thousands of feet of pipe that had deteriorated to a point where breaks and ruptures had become frequent, substantially impairing TVA's ability to run the boiler.

b. *TVA's Long Term Planning*

TVA's historical plans and strategies for creating and maintaining a power supply for its customers provide context for the fourteen TVA projects currently at issue. Throughout the 1960s and 1970s, TVA saw demand for electricity grow. To meet this demand, TVA began planning and constructing seventeen new nuclear power plants. EPA Enforcement Exs. 201; 279, at 3 (Hekking's pre-filed testimony). However, in the late 1970s, TVA's strategy changed dramatically when demand for electricity unexpectedly declined and public support for nuclear power waned. EPA Enforcement Ex. 279, at 3; Tr. at 129. Instead of relying on newly constructed nuclear plants, TVA decided to extend the lives of the coal-fired units originally intended to be replaced by the new nuclear plants. EPA Enforcement Ex. 201. TVA eventually abandoned its nuclear plant construction plans and focused primarily on its older coal-fired units. A 1987 report written by two of TVA's employees for the Electric Power Research Institute describes TVA's strategy:

> The coal-fired units that were expected to be replaced by those cancelled nuclear units will now have to be used at least for the rest of this century. This will require continued reliable operation of all coal-fired units now in service.
>
> If 40 years is assumed to be the useful life of a coal-fired unit, after which the unit would be retired, the oldest TVA plant would retire in 1991. By the year 2000 all 50 units of less than 500 MW would be retired, removing a total of 8,250 MW from the system generating capacity. * * * [This] illustrate[s] the need for a comprehensive program to address what is required for each unit to make the equipment perform

> reliably for another 20 years or more under predicted operating conditions. This program was called the Fossil and Hydro Unit Evaluation and Modernization Program (FHUEM).

EPA Enforcement Ex. 201, at 853-54. The goals of the FHUEM program, which TVA began in 1984, were:

> (1) to extend plant life 20 or more years beyond its design life of 35 to 40 years, (2) to maintain unit reliability and efficiency, and (3) to modernize by utilizing advanced technology.

EPA Enforcement Ex. 201, at 854. The program was not implemented as originally designed in large part because of the expense and the length of time each unit would be shut down for the replacement. *See* EPA Enforcement Ex. 279, at 4-5 (Hekking's pre-filed testimony). However, this program did identify particular components at TVA's coal-fired plants that would require replacement because those components were at the end of their useful lives. *Id*. TVA incorporated its findings under the FHUEM program into its ongoing "Capital Additions and Improvements Program," as discussed more fully below. *Id.* The program was used to fund the replacement of major equipment and their components.

c. *TVA's Organization and Operation*

Before discussing the physical changes made by TVA to the boilers, it is also useful to have a better understanding of how TVA conducted its operations, especially with respect to its procedures and accounting practices pertaining to construction activities at individual units. At the hearing, EPA Enforcement put two former TVA employees on the stand, Mr. Hekking and Mr. Donald Randolph, who both testified regarding TVA's operations and organization. Tr. at 101-325.

From 1978-1988, TVA had a single division for its coal-fired plants and the hydro plants, the Fossil and Hydro Power Division, within

which there was a separate group for the coal-fired plants. *See* EPA Enforcement Ex. 230 ("TVA Fossil & Hydro Organization"). Responsibilities for the coal fired-plants were allocated between the individual plants and the central office in Chattanooga as outlined below.

i. *Operations at the Plants*

At each coal-fired plant, TVA established three primary departments – operations, results, and maintenance. *Id.* The operations department ran the plant, the results department ensured efficiency of the plant, and the maintenance department was responsible for daily maintenance and work necessitated when forced outages occurred. Tr. at 109. Mr. Randolph described the plants' maintenance department duties as follows:

> [T]he plant maintenance department was primarily responsible for the running maintenance, routine maintenance to keep the plant going. They had all crafts people. They had a few engineers, and they dealt with the day-to-day maintenance problems at the plant.

Tr. at 110. Among the kinds of projects that each plant's maintenance department would perform were such items as fixing a valve leak and replacing a failed tube. *Id.*

ii. *TVA's Central Office*

TVA also had a central office in Chattanooga that contained, among others, a plant maintenance branch. The plant maintenance branch of the central office coordinated with the maintenance departments at the plants on major replacement projects that the plant's maintenance staff alone could not undertake. Tr. at 114. Mr. Randolph characterized the role of the central office's plant maintenance group by stating: "[W]e functioned primarily like a contractor to the plant, only we were an in-house contractor." Tr. at 119.

Within the central office plant maintenance branch was a boiler

and auxiliaries ("boiler") group, which was further subdivided into several sections. The engineering section of the boiler group was responsible for assessing boiler problems. Among other responsibilities, it would prepare the necessary paperwork to initiate large construction projects that the maintenance department at an individual plant could not handle. Tr. at 115. High level management approval at the central office was required before any such project could proceed. Tr. at 118. The required approval levels for each project varied depending on the project cost. EPA Enforcement Ex. 279, at 15 (Hekking pre-filed testimony). In the 1980s, TVA required approval by its Board of Directors on all projects over $1 million. *Id.* In the 1990s, Board approval was required for projects over $2.5 million. *Id*.

Following approval of a project, a field supervisor from the construction section, which was also a part of the boiler group, would be assigned to oversee each project. The construction section was responsible for hiring additional craftsmen needed for each particular project and for overall project implementation. Tr. at 119.

In 1988, TVA reorganized in a way that, among other things, affected the construction section. Thereafter, when the planning and approval of a project was completed, the project was transferred to a new division, the Fossil and Hydro Modification Division, for implementation. Tr. at 123-24.

iii. *The Central Office's Control of These Projects*

As described above and outlined in more detail below, TVA distinguished between projects by placing responsibility for larger construction projects with the central office, while leaving responsibility for smaller projects to each plant's maintenance department. As discussed below, all of the projects at issue in this case were ultimately handled, not by the plant's maintenance department, but by the central office's plant maintenance department. In essence, these were among the largest projects undertaken by TVA at its coal-fired power plants.

d. *TVA's Budgets*

Not only did TVA distinguish between projects by placing responsibility for the larger construction projects with the central office, but TVA's operations further differentiated between projects through the budgeting process. The yearly operation and maintenance budget ("O&M budget") for each plant was used for any projects undertaken by a plant's maintenance department, while the projects planned and implemented by the central office's plant maintenance branch used money in the capital budget. *See* Tr. at 112, 120. From the record, it appears that the two budgets – the O&M budget and the capital budget – were distinct from one another. Tr. at 120-21.

As early as the 1970s, TVA had a capital additions and improvements ("Capital A & I") program. TVA used this program to fund "replacement of major equipment and some of their components." EPA Enforcement Ex. 279, at 14. TVA's own policy for distinguishing between capital projects (the Capital A & I budget) and maintenance projects (O&M budget), known as its Capitalization Policy, is enlightening:

> In general, projects which add new tangible assets or leave existing tangible assets in better condition for profitable service than when new are given a capital classification (e.g., increase capacity, efficiency, or useful life.) Projects which only restore tangible assets to a former serviceable condition are maintenance.

EPA Enforcement Ex. 152. TVA's Capitalization Policy goes on to further define what is not a capital project:

> A capital classification is *not* given to projects that: inspect, test, assess, and report on the condition of existing tangible assets specifically to determine the need for repairs, replacements, and rearrangements; prevent failure, *restore serviceability*, or *maintain useful life* of existing tangible assets; rearrange or

> change the location of existing tangible assets; repair or restore existing tangible assets for reuse * * *.

Id. (emphasis added). When TVA classified a project as a capital project, TVA recognized that the project added a new tangible asset or left an existing tangible asset in an improved condition. Thus, under TVA's classification policy, TVA's classification is directly relevant to the purpose of the project – to improve the unit, rather than simply maintain the status quo.

e. *The Projects*

With this as background, we now apply the four factor test EPA historically has used, and which was upheld by the court in *WEPCO*, to the projects at issue in this case. For ease of reference, we have incorporated into this decision in general form EPA Enforcement Ex. 273, which gives a general description of the fourteen projects.[43]

TVA COAL-FIRED PLANT PROJECTS

Plant/Unit/ Date in Service	**Project**	**Cost**	**End Date**
Allen #3 (1959) 330 MW	Redesigned and replaced horizontal reheater. Outage: 3 months.	$10.78 million	1992-93
Bull Run #1 (1967) 900 MW	Replaced economizer and secondary superheater spaced outlet sections in each of 2 furnaces. Outage: 3 months.	$8.3 million	1988

[43]The essence of this exhibit was not seriously contested by TVA.

Plant/Unit/ Date in Service	Project	Cost	End Date
Colbert #5 (1965) 500 MW	Replaced waterwalls and horizontal reheater, modification to the startup system, added wingwalls in the furnace, replaced gas proportioning dampers, replaced windbox, redesigned and replaced control system, and added balanced draft conversion. Outage: 13 months.	$57.1 million	1982-83
Cumberland #1 (1973) 1300 MW	Replaced and redesigned secondary superheater outlet headers, replaced secondary superheater pendant elements and replaced lower slope and lower waterwalls. Outage: 3 months.	$22.91 million	1996
Cumberland #2 (1973) 1300 MW	Replaced and redesigned secondary superheater outlet headers, replaced secondary superheater pendant elements and replaced lower slope and lower waterwalls. Outage: 3 months.	$18.41 million	1994

Plant/Unit/ Date in Service	Project	Cost	End Date
John Sevier #3 (1956) 135 MW	Replaced superheater platen elements, all burner tube panels in both furnaces, and waterwalls in front, rear, and sidewalls of both furnaces. Outage: 2.5 months.	$3.94 million	1986
Kingston #6 (1955) 200 MW	Replaced all reheater and superheater intermediate pendant elements, waterwalls of superheater and reheater furnaces. Outage: 2 months.	$2.6 million	1989
Kingston #8 (1955) 200 MW	Replaced all reheater and superheater intermediate pendant elements, waterwalls of superheater and reheater furnaces. Outage: 3 months.	$2.9 million	1989-90
Paradise #1 (1963) 770 MW	Replaced all 14 cyclones and lower furnace walls, floor and headers. Outage 6.5 months.	$16.3 million	1985
Paradise #2 (1963) 770 MW	Replaced all 14 cyclones, lower furnace walls, floor and headers. Outage: 4.5 months.	$15.79 million	1985-1986

Plant/Unit/ Date in Service	Project	Cost	End Date
Paradise #3 (1970) 1150 MW	Replaced all 23 cyclones and lower furnace walls, floor and headers. Outage: 6 months.	$29.44 million	1985
Shawnee #1 (1953) 175 MW	Replaced secondary superheater and reheater pendant elements and crossover elements, including header stubs. Outage: 3 months.	$4.5 million	1989-90
Shawnee #4 (1953) 175 MW	Replaced secondary superheater and reheater pendant elements and crossover elements, including header stubs. Outage: 2 months.	$5.1 million	1990
Widows Creek #5 (1954) 141 MW	Replaced secondary superheater and crossover elements, and reheater and crossover elements. Outage: 4 months.	$4.13 million	1989-90

In the discussion that follows, we cite to the facts in the record that are most significant in determining whether TVA's projects were routine maintenance, repair, and replacement using the four factor approach identified above. We further address the main points that EPA Enforcement and TVA raise in support of their respective arguments.

On balance, as indicated below, we conclude that TVA has not met its burden of establishing by a preponderance of the evidence that the nature and extent, purpose, frequency, and cost of these projects was

such that they fell within the regulatory exception for routine maintenance, repair, or replacement.[44] Our judgment is informed by all the evidence in the record, the totality of which is insufficient to establish that these projects properly fall within the scope of this exception.

Our general findings under the four factor test are stated below. Further detail regarding our findings on a project-by-project basis can be discerned from Appendix A to this decision, which catalogues our findings for each of the fourteen projects in question. In finding that TVA has failed to carry its burden of proving that its projects fall within the exception for routine maintenance, repair, and replacement, we find material the following facts:

1. Nature and Extent

- The construction activities involved in these projects affected significant boiler components and typically was massive, including in some cases the construction of onsite railroads and monorails and the replacement of miles (in one instance 67 miles) of tubing.

- TVA's central office, including staff from its construction and (after 1988) modification group developed and carried out the projects, rather than the maintenance department located at each plant.

- The projects took many years to plan, in most cases well beyond the time associated with planning TVA's scheduled maintenance outages which took place approximately every eighteen months. Moreover, these

[44]While we have held that TVA bears the burden of proof on this issue, we do not see our conclusion here as hinging on our burden of proof ruling. Indeed, the evidence is such that, even if EPA Enforcement had the burdens of production and persuasion to establish that each of the fourteen projects did not constitute routine maintenance, repair, or replacement, those burdens would be met.

projects required TVA's Board of Director's approval, whereas plant managers approved the projects handled by the maintenance departments at TVA's plants. Tr. at 112.

- Implementation of the projects required plant shutdowns of many months (ranging from two to thirteen months), substantially in excess of the time period typically associated with forced outages which lasted a few hours to five days. Significantly, these projects also required substantially more time to complete than was typically required for TVA's scheduled maintenance outages which occurred every eighteen months and usually required the shutdown of a unit for approximately four weeks. *See* Tr. at 225.

2. Purpose

- The purpose of the projects generally was to significantly extend the life of the unit in question by as much as twenty years.

- All projects were classified as "capital" rather than as "maintenance" projects. TVA's Capitalization Policy provides such classification for projects that add tangible new assets or leave existing assets in "better condition" than when the original asset was installed for profitable service, but defines as maintenance projects those projects that merely restore tangible assets to serviceability.[45]

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[45]The Board has reviewed TVA's arguments against using the capital classification as a relevant factor in evaluating whether the projects fall within the routine maintenance exception. TVA argues that:

> [its] decisions with respect to accounting for plant-related

(continued...)

3. Frequency

- As in the *WEPCO* case, these replacements had generally never before been performed on these units and were considered to be rare replacements for such units.

- Although TVA introduced evidence that it and others in the industry had made similar replacements at other facilities, the evidence did not show that these replacements were other than uncommon in the lifetime of a unit.

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[45](...continued)
expenditures are based on the application of generally accepted accounting principles ("GAAP") and the accounting guidelines promulgated by the Federal Energy Regulatory Commission ("FERC") under the Uniform System of Accounts ("USoA"). * * * Neither GAAP nor the USoA provide a working definition of "routine" for purposes of accounting for plant-related expenditures.

TVA Post-Hearing Brief at 36-37. We agree that, by itself, the capital classification would not determine what activities are or are not "routine" under NSR. However, due in large part to TVA's own distinction between the capital and maintenance classification in its Capitalization Policy, *see* EPA Enforcement Ex. 152, which is consistent with the FERC USoA rules, we believe the designation does provide some insight into the purpose, as well as the nature and extent, of the projects since TVA's classification recognized whether a project was intended to improve a unit or merely maintain it. *See* EPA Enforcement Ex. 152. Furthermore, in determining whether each project falls within the scope of the routine maintenance exception, our review not only looks at whether TVA classified a project as a capital project, but also looks to other related facts in the record. Thus, in the TVA context, large capital projects were centrally managed, required years of planning, and required high-level approval. Collectively, this information bears on our determination whether the projects are "routine" under NSR.

4. Cost

- All projects cost in excess of $2.5 million (ranging from $2.6 million to $57.1 million) and required approval of TVA's Board of Directors.[46]

- The cost of implementing these projects would have consumed most of each plant's O&M budget and in some cases would have exceeded the plant's O&M budget.

TVA disputes a number of these considerations. For example, TVA disputes the relevance of its division of responsibility between its plants and the central office.[47] Particularly, TVA argues that it chose to

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[46]The Board has generally not relied on the testimony given by Mr. Michael Majoros, an EPA Enforcement witness, regarding the relative costs of each project to the unit's original cost. TVA objected to his analysis. We find TVA's objection to this aspect of his testimony to be generally valid since Mr. Majoros compared only "nominal" dollar, not real dollar values in all except two projects. This being said, we did not find the evidence adduced by TVA regarding relative costs to be particularly helpful either. TVA compared the cost of each project for a single boiler to the cost of the plant's entire boiler system, which contains many units.

Mr. Majoros did convert the dollars for Shawnee Unit 1 and Paradise Unit 1 from nominal to real dollars. We find Mr. Majoros' testimony useful in these instances, and, after reviewing the record, are in these instances unconvinced as to TVA's charge that his testimony is inaccurate. After Mr. Majoros corrected his reference to Account 312, and instead referred to Plant Unit Number ("PUN") 167-1, his testimony appears accurate. Indeed, TVA's accountant, James Callahan, testified that Mr. Majoros' numbers appeared accurate. Tr. at 886-87.

[47]In its Post-Hearing Brief, TVA argues that its use of central office staff in implementing these projects is not a relevant fact in determining whether those projects are routine since plant maintenance staff were also used on capital projects. TVA Post-Hearing Brief at 23. However, in reviewing the record in the matter, the Board finds persuasive the fact that use of plant maintenance personnel for capital projects occurred only with "small capital projects" and that the larger construction projects were handled by TVA's central office. *See* Tr. at 195. Thus, TVA distinguished between projects of a certain magnitude and scope.

centralize certain duties for efficiency and, therefore, the fact that the projects at issue were managed by its central office is irrelevant to the determination of a project's routineness. Since the size of the project appears to bear materially on the decision whether to manage the project out of the central office, and smaller projects were generally thought of as "running or routine maintenance" and given to the plant's maintenance department to undertake, we cannot agree that this consideration is irrelevant. While this consideration alone may not be dispositive, taken in conjunction with other facts, it does support a finding that the projects under review here are outside the routine maintenance exception.

TVA also takes issue with EPA Enforcement's use of the length of time TVA took to plan each project. TVA argues that since the *WEPCO* court did not use this fact in deciding the *WEPCO* project was nonroutine, EPA Enforcement should not use this fact either. We believe the length of time a project takes to plan and approve can be relevant to the four factor test because it goes directly to the nature and extent of the project. Where, as here, project planning takes months, sometimes years, beyond the planning necessary for regular, ongoing maintenance, this fact creates an inference that the project is not "routine" because such a long planning and approval process is needed.

As discussed more fully below, TVA's principal defense – that it had become common practice at TVA and generally within the industry and thus "routine" in this industry, to make such once or twice-in-a-lifetime replacements – is alone not enough to carry TVA's burden to establish that these projects fit within the narrow regulatory exception for routine maintenance, repair, and replacement. Nor are we persuaded that only replacements of the magnitude of those at issue in *WEPCO* are outside the scope of the routine maintenance exception. As EPA argues persuasively, *WEPCO* did not set a minimum floor below which a project comes within the scope of the exception. Rather, the determination is made on a case-by-case basis applying a reasonable test which evaluates nature and extent, purpose, frequency, and cost.

In approaching the question of what is routine, there is nothing in the regulatory history of the routine maintenance exception that calls for us to leave common sense behind. The testimony at the hearing of two former TVA officials[48] lends striking support for the common sense test that we are following. Donald Randolph, former manager of TVA's central Boiler Equipment Section and an employee of TVA for over fifteen years, and Alan Hekking, a former TVA plant manager and an employee of TVA for more than twenty years, both testified that projects of the kind at issue in this case were not "routine maintenance" in their understanding of that term.[49] For example, on cross-examination, Mr. Randolph testified as follows:

> Q. Now, if you assume that routine means customary in the industry, standard operating procedure, would you

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[48]During his fifteen years with TVA, Mr. Randolph held various positions including: section supervisor of the valve and heat exchanger section in the plant equipment branch of the Fossil and Hydro Power Division at the central office, and manager of the plant boiler equipment department within the same division. Mr. Randolph is currently self-employed as a consulting engineer and analyzes failures and welding problems. Tr. at 102-07.

During Mr. Hekking's twenty years at TVA he held various positions and titles including: mechanical maintenance supervisor at the Johnsonville Plant, assistant plant superintendent at the Allen plant, plant manager at the Allen plant, and an interim position as manager of fossil operations. Mr. Hekking currently works for the Memphis and Shelby County Health Department as a supervisor of the Title V/Major Source Group in Pollution Control and as an independent consultant for EPA Enforcement in this matter. EPA Enforcement Ex. 279, at 1; Tr. at 264-265.

[49]TVA has attempted to discount Mr. Randolph's and Mr. Hekking's testimony on the question of what is routine by pointing out that each had prepared a planning report for a capital project which checked in the affirmative a box stating, "Routine Improvement of Existing TVA Facilities." According to TVA, this reflected that these witnesses had changed their interpretation of routine maintenance over time. TVA Post-Hearing Brief at 17-19. Mr. Hekking was not asked about the alleged inconsistency in cross-examination. Mr. Randolph was, however, and refused to equate "routine improvement" with "routine maintenance." Given this fact, and the fact that it is not apparent to us that these are, in fact, equivalent terms, we are not inclined to disregard the testimony of these witnesses.

> then agree that it is a routine maintenance strategy in the industry and for TVA to perform the type of maintenance, repair, and replacement that we have been discussing here by TVA?
> A. I do not consider these major replacement projects routine maintenance. That [sic] is *major* maintenance projects.
> * * * *
> Q. Would you agree here that routine improvement refers to, in this particular case, a routine replacement to TVA?
> A. The problem I would have with that, this is the first time in 36 years and it is hard for me to say that is routine.

Tr. at 192-93, 196-97. Mr. Hekking had a complementary view. On direct, he testified as follows:

> Q. When this project [Allen Unit 3] was implemented back in 1992 and 1993, Mr. Hekking, did the Tennessee Valley Authority consider this project to be routine maintenance or routine repair or routine replacement?
> A. No, sir.
> Q. Can you tell us why?
> A. A number of reasons. * * * The money spent on this one project alone exceeded my annual budget. I think that is one reason it wasn't routine. It was performed during an outage. I told you that a routine scheduled outage for us was four weeks. This was a 12-week outage. That was not routine. The reheater that we put back in, we replaced an entire component. It wasn't a tube or several tubes or couple of elbows, it was an entire component, a large component. That was not routine.

Tr. at 246-47. On cross-examination, Mr. Hekking continued:

> Q. In your opinion does the number of reheaters replaced in the industry, let's say – let's talk about reheaters because that's what you talked about at the Allen plant. Let's say that there were 100 reheaters replaced in the entire industry or 200 or 300 or 500; does that make it routine maintenance or routine replacement?
> A. No sir. If it's replaced once in its lifetime of 30 years, that's not routine.

Tr. at 324.[50]

As we have said, we do not believe that Congress in the statute or EPA in its underlying regulations excluded such carefully planned, massive rebuilding efforts from the requirements to obtain a permit and put on appropriate pollution controls. Although numerous activities properly fall within the exception for routine maintenance, repair, and replacement,[51] to conclude that these activities are within its scope would

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[50]For its part, TVA's witnesses, e.g. Jerry Golden and Gordon Parks, offered the view that these projects were routine principally because they had been undertaken elsewhere in the industry. *See* TVA Ex. 4. They did not refute Mr. Randolph's and Mr. Hekking's premise that the projects under review here were highly unusual in the life of a given unit and fell outside the scope of regular maintenance practice at individual units.

[51]The record supports the conclusion that activities undertaken in short-term forced outages (typically five days or less) and most maintenance undertaken as part of regular planned maintenance outages (four-week outages occurring every eighteen months) will typically fall within the ambit of "routine." *See, e.g.*, Tr. at 109-10, 242-43. For example, in characterizing the kind of routine maintenance undertaken by plant maintenance staff, Mr. Randolph stated as follows:

> There was all kinds of stuff. * * * [I]f a valve started leaking, it would be up to them to repack that valve, maintain it, get it back into the proper order. If the boiler went into emergency outage, forced outage, boiler tube ruptured, blew, it would be up to them and when the unit came off-line to get in there, cut that tube out, put a Dutchman or replacement tube in, and get it repaired and get back

(continued...)

stretch the exception beyond reason. For these kinds of physical changes at existing facilities, Congress made a judgment that in order for the projects to proceed they must be balanced with careful up-front review designed to protect the environment. It is hardly surprising that where, as here, major changes are being made to the boiler, modifications can simultaneously be made to the boiler's flue gas ducts, where the pollution control equipment is typically located. Accordingly, these modification projects are a natural and efficient occasion to upgrade pollution control equipment. Any other result would, in our view, constitute a "perpetual immunity" for existing plants, a result flatly rejected by Congress and the circuit courts in *Alabama Power* and *WEPCO*.

In sum, the Board finds, based on its application of the four factor test - nature and extent, purpose, frequency, and cost - to the evidence in the record of this case, that none of the fourteen projects before the Board qualifies for the routine maintenance exception.[52]

4. *Fair Notice and Rulemaking Arguments*

TVA raises two defenses to the application of the exception for routine maintenance, repair, and replacement, as we are interpreting that phrase. First, TVA argues that it did not have fair notice of this interpretation because it was not "ascertainably certain" either from the regulations themselves, or from EPA's statements regarding those regulations. TVA Post Hearing Brief at 91-98. Further, TVA argues that EPA has changed its interpretation of the routine maintenance, repair, and replacement exception without the requisite notice and comment rulemaking and that retroactive application of EPA's new interpretation would be unfair, given TVA's alleged reliance on EPA's prior

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[51](...continued)
on-line.

Tr. at 110.

[52]*See supra* Part III.C.3.e (summary of our findings).

interpretation in performing the projects. *Id.* at 44-46. For these reasons, TVA argues, the Board must withdraw the Compliance Order.

a. *Fair Notice*

TVA argues that EPA's interpretation of the regulatory exception was not "ascertainably certain" and did not provide TVA with fair notice. *See* TVA Post-Hearing Brief at 81-106. Accordingly, based on the case law discussing the need for fair notice in the regulatory arena, TVA concludes that it cannot be liable for violating any preconstruction permitting requirements of the Act. For the following reasons, TVA's contention that it lacked fair notice must be rejected.

The Supreme Court has stated, "[R]egulations affecting only economic interests must be sufficiently definite so that ordinary people exercising common sense will know what they mean." *Boyce Motor Lines v. United States* 342 U.S. 337, 340 (1952). In further expressing the idea of the need for fair notice to the regulated community, the D.C. Circuit has observed:

> [W]e must ask whether the regulated party received, or should have received, notice of the agency's interpretation in the most obvious way of all: by the reading of the regulations. If, by reviewing the regulations and other public statements issued by the agency, a regulated party acting in good faith would be able to identify, with 'ascertainable certainty,' the standards with which the agency expects parties to conform, then the agency has fairly notified a petitioner of the agency's interpretation.

General Elec. Co. v. EPA, 53 F.3d 1324, 1329 (D.C. Cir. 1995).

Significantly, providing fair notice does not mean that a regulation must be altogether free from ambiguity. Indeed, the case law shows that even where regulatory ambiguity exists, the regulations can still satisfy due process considerations. *See, e.g., Texas Eastern Prod.*

Pipeline Co. v. OSHA, 827 F.2d 46 (7th Cir. 1987). In this regard, the D.C. Circuit has observed:

> While interests furthered by the Due Process Clause and the First Amendment favor such regulation by bright lines, we are quite unprepared to hold that the Due Process Clause prohibits a contextual regulation. Reading such a requirement into the Clause would likely invalidate most criminal statutes and administrative regulations.

United States v. Thomas, 864 F.2d 188, 198 (D.C. Cir. 1988). Thus, the question is not whether a regulation is susceptible to only one possible interpretation but rather whether the particular interpretation advanced by the regulator was ascertainable by the regulated community.

In its prior cases examining such issues, the Board has stated that in determining whether notice has occurred one should first look to the language of the regulations. "[T]he analysis would next proceed to a determination of whether the Region's interpretation embodied in the rule or statement was reasonable in light of the language of the regulation and the overall structure of the regulatory scheme." *In re CWM Servs., Inc.*, 6 E.A.D. 1, 18 n.28 (EAB 1995); *see also In re B.J. Carney Indus.*, 7 E.A.D. 171, 195 (EAB 1997) (holding that the regulatory definition of "process wastewater" is sufficiently clear to give an ordinary person reasonable notice of prohibited conduct), 192 F.3d 917 (9th Cir. 1999), *vacated as moot*, 200 F.3d 1222 (9th Cir. 2000); *In re V-1 Oil Co.*, RCRA (9006) Appeal No. 99-1, slip op. at 30-34 (EAB, Feb. 25, 2000), 8 E.A.D. ___ (applying standards set forth in *General Electric Co.*, 53 F.3d at 1329, to reject fair notice affirmative defense). Accordingly, we regard the statutory and regulatory context within which a regulation was promulgated as highly instructive in determining whether a meaning ascribed to the regulation was ascertainable.

In the present case, TVA states that EPA's further statements on the subject, particularly in the form of the NSPS exception for routine maintenance and the preamble to the 1992 amendments to the NSR rule,

did not communicate the interpretation that EPA Enforcement is embracing in this case with "ascertainable certainty." Additionally, TVA cites to the privilege log,[53] produced by EPA Enforcement for this matter, to infer that because EPA Enforcement asserts a deliberative process privilege over certain documents pertaining to the exception, there must be continuing uncertainty regarding the interpretation inside the Agency. If EPA itself is uncertain about its meaning, then surely, according to TVA, its interpretation could not have been ascertainable by the regulated community. *See* TVA Post-Hearing Brief at 97-99.

We have difficulty accepting TVA's premise that the regulatory text fails to adequately put the regulated community on notice of the interpretation that we are following here. As discussed in Part III.C.2, when the context within which this regulatory exception rests is considered, the interpretation that we are following is not at all difficult to distill. As we have discussed at length, this context includes Congress' sweeping coverage under the CAA of "*any physical change*" (emphasis added) at existing facilities; the fact that this exception is expressly provided for only by the regulations, not the text of the Act; *Alabama Power's* holding that regulatory exclusions under the NSR program were available to the Agency only where it could demonstrate the exempted activity was de minimis or of administrative necessity; and the notion articulated in *Alabama Power* and *WEPCO* that the grandfathering accorded existing sources was not intended to allow "perpetual immunity" from NSR. TVA was hardly unaware of this context. To the contrary, it is a sophisticated entity, represented by experienced counsel that has actively participated in rulemaking, and other activities pertaining to the CAA. *See* Tr. at 711-13; EPA Enforcement Post-hearing Brief, Attach. J and K.[54]

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[53]The privilege log refers to a log produced by EPA Enforcement to TVA during this reconsideration process containing a list of documents that EPA Enforcement has withheld on the grounds of privilege.

[54]*See also United States v. City of Menominee*, 727 F.Supp. 1110, 1122 (W.D. Mich. 1989) (Defendant is disingenuous to assert that it assumed "all was well," when (continued...)

As we have also discussed, by contrast, the alternative interpretation that TVA advances, which looks to whether a project has been undertaken elsewhere in the industry or in any one of TVA's plants, is fundamentally at odds with that context and, accordingly, unnaturally strains the regulatory text of the exception in question. Further, the phrase "routine maintenance, repair, and replacement" is itself entirely consistent with the meaning which emerges from a contextual reading. Indeed, even without benefit of context, the use of the word "routine" puts the reader on notice that irregular or unusual activities may not qualify. Although TVA asserts that the exception cannot be read to require anything more than proof that a like project has occurred somewhere in the industry in order for such an activity to be considered "routine," the notion that in determining what is routine one should include as an important consideration the significance of the activity in the life of the unit at issue or other comparable units in the industry does not, in our view, add unascertainable gloss to the regulation's text.

TVA points to the language in the preamble to the 1992 amendments to the NSR rule referencing the need to evaluate "whether a given type of equipment has been repaired or replaced by sources within the relevant industrial category," *see* 57 Fed. Reg. 32,314, 32,325 (1992), and to a similar reference in the NSPS regulations[55] to support its conclusion that the regulation has a singular focus, that being whether the activity has been undertaken somewhere else within an industry. As we have already discussed, we are not persuaded that TVA's restatement

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[54](...continued)
defendant is a sophisticated corporate player, represented by experienced counsel, heavily involved in activities that are pervasively regulated. Under these circumstances, the defendant should have inquired as to which permit governed its activities.).

[55]"The following shall not, by themselves, be considered modifications under this part: (1) Maintenance, repair, and replacement which the Administrator determines to be routine for a source category, subject to the provisions of paragraph (c) of this section and § 60.15." 40 C.F.R. § 60.14(e). As discussed in reference to TVA's prior cite to the NSPS regulations, they are not applicable to the PSD and nonattainment NSR permitting requirements and, thus, are not relevant in this context.

of these references represents their only, or more natural, reading. *See supra* Part III.C.3. Indeed, the 1992 preamble reemphasized that the determination was a case-by-case one. *See* 57 Fed. Reg. at 32,325 (1992). Moreover, the interpretation that we are embracing accepts as an essential ingredient the idea that determining routineness must consider the industrial context of the activity at issue. But it also goes on to look at the four factors – nature and extent, purpose, frequency, and cost – in light of the industry in which the activity occurs.

We are likewise not persuaded that the mere fact that EPA's privilege log includes deliberative documents that may discuss the routine maintenance exception indicates that the interpretation that we are following was not ascertainable to TVA. Whether or not there are ongoing deliberations regarding how to implement this aspect of the New Source Review Program says ultimately very little about what was ascertainable to TVA.

At bottom, it is difficult for us to see how TVA can credibly argue that it could not have foreseen that projects of the magnitude of those at issue here might be determined to be nonroutine. Indeed, as early as 1984, a TVA official stated, "If modifications proposed are extensive enough to be considered reconstruction EPA might try to apply the new source performance standards." *See* EPA Enforcement Ex. 139, at 8922750. There was, in our view, ample notice to TVA that it was engaged in conduct that would be questionable, when examined under the four factor, case-by-case inquiry referenced in Agency guidance and ultimately adopted as reasonable by the court in *WEPCO*. Indeed, there is the appearance here that, rather than confused, TVA was simply assuming a calculated risk.[56] As the D.C. Circuit observed in another

[56]It may well be that TVA's choice to assume the risk was influenced by the fact that, historically, EPA had not pressed the point through enforcement actions. *See* TVA Response to Initial Brief at 27, 38. But EPA's alleged lack of enforcement is immaterial to TVA's claim that it did not have notice of the regulation's import since the regulatory provision on its face should have provided TVA with appropriate notice. Moreover, it does not explain TVA's choice never to seek a determination from the Agency concerning any of its projects. *See* discussion in Part III.C.4.a.

(continued...)

setting, "[I]t is not unfair to require that one who deliberately goes perilously close to an area of proscribed conduct shall take the risk that he may cross the line." *DiCola v. FDA*, 77 F.3d 504, 508 (D.C. Cir. 1996) (citation omitted).

We also find it striking that TVA is unable to point us to a single instance in which, notwithstanding the magnitude of the projects that it was undertaking, it sought a determination from the relevant regulatory agency regarding the applicability of the routine maintenance exception to these projects.[57] TVA argues that its failure to do so is irrelevant. In

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[56](...continued)

Although TVA does not raise an estoppel argument with regard to EPA's alleged lack of enforcement, it is worth noting that such arguments typically fail as a matter of course since a lack of enforcement generally does not rise to the level of "affirmative misconduct" by the government. *See In re B.J. Carney Indus.*, 7 E.A.D. 171, 197 (EAB 1997) ("the Region's conduct [of a five-year delay initiating its enforcement action] did not rise to the level of 'affirmative misconduct' necessary to meet the heavy burden of estopping the government, and hence it must fail."), 192 F.3d 917 (9th Cir. 1999), *vacated as moot*, 200 F.3d 1222 (9th Cir. 2000); *In re Newell Recycling Co.*, TSCA Appeal No. 97-7, slip op. at 43 (EAB, Sept. 13, 1999), 8 E.A.D.__ (Region's commencement of enforcement action after a period of inaction did not give rise to an estoppel against the government). Similarly, laches, which TVA does raise in its Answer but has not argued in its briefs, is not an affirmative defense that in general can be raised successfully against the government. *See Nevada v. United States*, 463 U.S. 110, 141 ("the Government is not in the position of a private litigant or a private party"); *FDIC v. Husey*, 22 F.3d 1472, 1490 (10th Cir. 1994) (the general rule is that the United States is not subject to the defense of laches); *Bostwick Irrigation Dist. v. United States*, 900 F.2d 1285, 1291 (8th Cir. 1990) ("[W]e have recognized the long-standing rule that laches does not apply in actions brought by the United States.").

[57]It is commonplace for sources regulated under the CAA to seek applicability determinations in circumstances of uncertainty. The regulations provide for such determinations, *see* 40 C.F.R. § 60.5; 57 Fed. Reg. 32,314 (1992), and EPA has encouraged their use. 57 Fed. Reg. at 32,332 (1992) ("The EPA anticipated, however, that questions will arise regarding certain aspects of this proposal. Because some instances involve discrete judgments, utilities may wish to obtain determinations of applicability. The EPA will provide such determinations upon request* * *."). Indeed, *WEPCO* emerged from a 1988 EPA applicability determination. *See WEPCO*, 893 F.2d (continued...)

this regard, TVA cites *Hoechst Celanese*, a district court decision from South Carolina, as supporting TVA's argument that it was under no compunction to seek clarification from the Agency. However, a close reading of the district court's decision reveals that the case does not stand for the proposition that the failure to inquire is irrelevant to a fair notice inquiry. In *Hoechst Celanese*, the defendant in an EPA enforcement action had, in fact, sought prior clarification from a state agency with delegated authority from EPA and had acted in reliance on the state's interpretation. The court merely found that because the company made an inquiry to the state agency, further inquiry to U.S. EPA was not required. *United States v. Hoechst Celanese Corp.*, 964 F. Supp. 967, 982 (D. S.C. 1996), *rev'd on other grounds*, 128 F.3d 216 (4th Cir. 1997), *cert. denied*, 524 U.S. 952 (1998).

The absence of an inquiry by TVA is, in our view, a relevant consideration in determining the availability of a fair notice defense in a case like this where the regulation's text and context put TVA on notice that significant projects might well be determined not to be routine maintenance, repair, and replacement. *See Fluor Constructors, Inc. v. OSHA*, 861 F.2d 936, 942 (6th Cir. 1988) ("If in doubt as to the nature of the lifeline requirement Fluor should have taken the safer position and installed separate lifelines, * * * or at least inquired of OSHA * * *."); *Texas Eastern Prod. Pipeline Co. v. OSHA*, 827 F.2d 46 (7th Cir. 1987) ("The regulations, while not models of clarity, should not have been incomprehensively vague to Texas Eastern. Texas Eastern made no inquiry.").

In sum, we find that TVA did have fair notice of the interpretation of the regulatory exception for routine maintenance, repair, and replacement that we are following in this case. We find that the

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[57](...continued)
901; *see also* Cyprus Casa Grande Corp. Supplemental PSD Applicability Determination (1987). We note that, apart from the absence of a TVA-specific determination, TVA has not pointed us to any other EPA applicability determination sufficiently on point to bring meaningful support to TVA's argument that its activities fall safely within the ambit of "routine."

interpretation was "ascertainably certain" from both the regulation's text and its context. Moreover, given the magnitude and circumstances of the projects at issue here, TVA reasonably should have been on notice that these projects may not qualify for the routine maintenance, repair, and replacement exception. To the extent that, notwithstanding this ascertainable certainty, TVA was unsure of its regulatory obligations pertaining to the projects, it should have sought clarification from the Agency. Failing to do so, it cannot credibly argue surprise as a result of the Agency's actions.

b. *New Rulemaking*

TVA makes the related argument that interpretation of the exception that we are following is a new interpretation and, therefore, requires notice-and-comment rulemaking before it can be applied. TVA Post-Hearing Brief at 44. To do otherwise, TVA maintains, would be manifestly unfair because TVA has relied on EPA's prior interpretation in undertaking past projects at its plants.

The starting point in addressing TVA's argument is to determine whether EPA did, in fact, change its interpretation. We conclude that the evidence in the record of this case does not support TVA's contention that EPA has changed its interpretation. Accordingly, we do not reach the legal question whether EPA was required to initiate notice-and-comment rulemaking to effectuate an interpretive change.

TVA has cited to a number of documents that it argues show that EPA once had a different interpretation of the regulation. These documents include a 1986 article entitled, "Extended Lifetimes for Coal Fired-Power Plants: Effect Upon Air Quality," written by two EPA staff employees**;** a General Accounting Office's ("GAO") 1990 Study on Electricity Supply; a draft 1990 report prepared for EPA by a contractor entitled, "Comparison of the Economic Impacts of the Acid Rain Provisions of the Senate Bill (S.1630) and the House Bill (S.1630) (sic)"; a 1989 letter from ICF Resources Inc., an EPA contractor, responding to an inquiry by the Edison Electric Institute; a 1994 draft document prepared by EPA for circulation to stakeholders for comment; and a

portion of a transcript from a May 2000 American Bar Association ("ABA") panel discussion.[58] *See* TVA Response to Initial Brief atts. O-P, T-U; TVA Post-Hearing Brief att. F.

We note at the outset two important weaknesses pertaining to the statements cited by TVA. First, with the possible exception of the 1994 draft notice, none of these statements can be taken as authoritative statements by the Agency. The GAO Report, for example, is unclear as to the source of the commentary that it references. The other statements are by Agency staff and contractors having no colorable authority to offer the Agency's official view on the subject.[59] Thus, for example, the article written by EPA employees explicitly states that the views expressed in the article are the personal views of the authors and do not represent the opinions of EPA.

The second weakness is that, of the documents cited, only the 1994 draft document to stakeholders explicitly addresses the routine maintenance, repair, and replacement exception, and we have questions concerning its relevance in this regard. The draft document that was circulated to stakeholders included draft regulatory text which allegedly would have written into the regulation specific criteria for determining what constitutes "routine" under the NSR regulations. *See* TVA Post-Hearing Brief att. F. As TVA notes, after "industry participants objected to the suggested definition, * * * EPA did not include the 1994 draft in its 1996 proposed NSR rule." TVA Post-Hearing Brief at 44. In TVA's view, this reveals that EPA was advancing a new interpretation of the regulations but failed to promulgate it. We think this reads too much

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[58]The 1994 draft document appears to be an EPA draft regulatory provision regarding the interpretation of the routine maintenance exception under NSR. The document was apparently circulated among EPA stakeholders for comment.

[59]With regard to the portion of the May 2000 ABA panel discussion, we are unswayed by the material provided to the Board. The discussion is not provided in full, and therefore, the context of the discussion cannot be determined, nor can we determine precisely to what the speaker is referring. Further, the informal discussion of a mid-level EPA employee cannot speak for the Agency. *See Paralyzed Veterans v. D.C. Arena*, 117 F.3d 579, 587 (D.C. Cir. 1997), *cert. denied*, 523 U.S. 1003 (1998).

into EPA's action. The fact that EPA may have been considering regulatory changes to make the definition of routine maintenance more explicit does not mean that it was changing its interpretation. It is equally plausible that the changes were confirmatory in nature, restating with greater particularity the Agency's preexisting interpretation.[60]

By implication, TVA argues that the Agency's prior view was the one espoused by TVA in this case. We have difficulty finding that any of the cited statements provides support for TVA's view that the Agency's analysis of routineness is limited to assessing whether a given project has been undertaken before somewhere else in the industry.

In sum, based on the limited references that TVA has cited, we are unprepared to find that EPA had earlier espoused an interpretation contrary to the one that we are following here.

D. *The Statutory Emissions Increase Requirement as Generally Applied in the PSD Programs (State and Federal)*

Having determined that a "physical change" was made at each of the fourteen coal-fired power units at TVA's nine electrical generating plants, we turn now to the second part of the statutory two-part test under the definition of "modification." It requires a demonstration that the physical change resulted in an increase in emissions of a regulated pollutant. In particular, the statutory definition, with emphasis on the emissions increase requirement, is as follows:

> The term "modification" means any physical change in, or change in the method of operation of, a stationary

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[60]Notably, TVA's suggestion that it was because of industry opposition that the Agency did not proceed with its more-specific definition of the routine maintenance exception is also open to question. In explaining its decision to drop the initiative, EPA explained that this was because "[w]ith other changes being made to NSR applicability, this issue becomes less important." EPA Enforcement Reply Brief, att. E (Letter from Mary D. Nichols, Assistant Administrator for Air and Radiation, U.S. EPA, to William H. Lewis, Morgan, Lewis and Bockius (May 31, 1995)).

source *which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.*

CAA § 111(a)(4), 42 U.S.C. § 7411(a)(4) (emphasis added). The regulations for the different programs (NSPS, SIPs, federal PSD, and federal nonattainment NSR) interpret and elaborate on this general statutory emissions increase requirement with detailed provisions.

We note at the outset that the regulations promulgated by EPA implementing the emissions increase test are different for NSPS and NSR. EPA succinctly described this difference in the preamble to NSR rule amendments promulgated in 1992:

> In the first step, which is largely the same for NSPS and NSR, the reviewing authority determines whether a physical or operational change will occur. If so, the reviewing authority proceeds in the second step to determine whether the physical or operational change will result in an emissions increase over baseline levels. In this second step, the applicable rules branch apart, reflecting the fundamental distinction between the technology-based provisions of NSPS and the air quality-based provisions of NSR.

57 Fed. Reg. 32,314, 32,316 (1992) (footnote omitted); *see also WEPCO*, 893 F.2d at 913 (noting that "each program [NSPS and PSD] measures emissions in a fundamentally distinct manner").

In this part of our decision, with one exception, we review the NSR regulatory requirements (both the federal program and the applicable state SIPs) regarding the emissions increase test and apply those requirements to the specific projects and pollutants which EPA

Enforcement alleges in its Post-Hearing Brief are at issue in this case.[61] We will also address TVA's argument that the statute requires application of the NSPS emissions increase test as part of all PSD and nonattainment NSR programs. One alleged NSR violation that will not be considered in this Part III.D is the SO_2 violation for Colbert Unit 5, which is governed by the Alabama nonattainment NSR program as it existed prior to amendment in 1983. The emission increase test under the pre-1983 Alabama nonattainment NSR program is similar to the federal NSPS emissions increase test and, therefore, will be discussed in Part III.E below along with the alleged NSPS violations at Colbert Unit 5.[62]

1. *Identification of the TVA Units and the Applicable State and Federal Regulations Discussed in This Part*

As noted above, the violations alleged in this case occurred between 1982 and 1996 at fourteen generating units located at nine coal-fired power plants in the states of Alabama, Kentucky, and Tennessee. At various times and for different pollutants, these three states had EPA-approved SIPs and were the applicable permitting authorities. In addition, at some points in time for some pollutants, the applicable permitting program was the federal PSD program. This array of different permitting programs, however, has not resulted in substantially different permitting requirements. To the contrary, the state SIPs generally adopted regulatory language modeled after the language of the federal programs for the pollutants at issue in this case. Accordingly, the regulatory requirements pertaining to emissions increases are generally the same and thus can be discussed generically in this part of our decision. The following is a brief identification of the power plant units,

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[61] *See supra* Part III.A (identifying claims that were abandoned by EPA Enforcement in its Post-Hearing Brief and identifying the pollutants at each unit that remain at issue).

[62] The NSPS regulatory requirements for the emissions increase test will be discussed below in Part III.E as well.

pollutants emitted by those units, and citations to the applicable regulations that will be discussed in this Part III.D.

As directed by the Board in its May 15 Order, the parties have entered into a comprehensive stipulation regarding both the attainment or nonattainment status of the areas of TVA's plants and the applicable state SIP provisions and federal regulations. *See* Regulation Stipulation. The parties have also attached copies of the applicable SIP provisions and federal regulations to the Regulation Stipulation, set forth in numbered tabs from 1 to 23. The units and the regulations that applied to them during the relevant time frames are as follows:

a. *Federal PSD Units*. Paradise Units 1, 2, and 3 were in an area classified as attainment for NO_2. Regulation Stipulation ¶ 3, at 6. During the relevant time, Kentucky did not have an approved SIP governing PSD permitting. *Id.* at 3, ¶¶ 4-5. Accordingly, the question as to whether TVA was required to obtain a preconstruction permit for NO_X for the physical changes to Paradise Units 1, 2 and 3 is governed by the federal PSD regulations.

b. *Kentucky PSD Units.* Shawnee Unit 1 and 4 were in an area classified as attainment for NO_2 and SO_2. *Id.* ¶ 4, at 6. At the relevant time,[63] Kentucky had an approved SIP for PSD. *Id.* ¶ 5, at 3-4. Accordingly, the question of whether TVA was required to obtain a preconstruction permit for these pollutants at these units is governed by the applicable Kentucky SIP provisions on PSD identified in the Regulation Stipulation ¶ 5, at 3-4.

[63]Construction of the physical changes to Shawnee Unit 1 was commenced on October 31, 1989. EPA Enforcement Ex. 134. The Kentucky SIP provisions governing PSD permitting became effective on October 2, 1989. Regulation Stipulation at 3 ¶ 5.

c. *Tennessee PSD Regulations (Pre-1994).* John Sevier Unit 3, Kingston Unit 6, Kingston Unit 8, and Bull Run Unit 1 were in a location classified during the relevant time as attainment for NO_2, SO_2, and TSP/PM_{10}. Regulation Stipulation ¶ 2, at 6. Tennessee had an approved SIP governing PSD permitting. *Id.* ¶ 2, at 2. Accordingly, the question as to whether TVA was required to obtain a preconstruction permit for these pollutants at these units is governed by the applicable Tennessee SIP provisions on PSD identified in the Regulation Stipulation ¶ 2., at 2.

d. *Tennessee PSD Regulations (Post-1994)*. Cumberland Units 1 and 2 were in an area classified as attainment for NO_2, SO_2, and TSP/PM_{10}. *Id.* ¶ 2, at 6. Tennessee had an approved SIP governing PSD permitting during this time. *Id*. ¶ 3,at 3. Accordingly, the question as to whether TVA was required to obtain a preconstruction permit for these pollutants at these units is governed by the applicable Tennessee SIP provisions on PSD identified in the Regulation Stipulation at 3 ¶ 3.

e. *Tennessee SIP, Memphis-Shelby County.* Allen Unit 3 was located in an area classified as attainment for NO_2, SO_2, and PM_{10} during the relevant time. *Id.* ¶ 1, at 5-6. The Allen plant is within the jurisdiction of the Memphis/Shelby County portion of the Tennessee SIP. *Id*. ¶ 1, at 2. Accordingly, the question as to whether TVA was required to obtain a preconstruction permit for these pollutants at this unit is governed by the applicable Tennessee SIP provisions on PSD identified in the Regulation Stipulation ¶ 1, at 2.

f. *Alabama PSD Regulations (Pre-1987).* Colbert Unit 5 was located in an area classified as attainment for NO_2

and TSP/PM_{10}.[64] *Id.* ¶ 5, at 6. At this time, Alabama had an approved SIP for PSD. *Id.* ¶ 6, at 4. Accordingly, the question as to whether TVA was required to obtain a preconstruction permit for these pollutants at this unit is governed by the applicable Alabama SIP provisions on PSD identified in the Regulation Stipulation ¶ 6, at 4.[65]

g. *Alabama PSD Regulations (Post-1987).* Widows Creek Unit 5 was in an area classified as attainment for NO_2 and TSP/PM_{10}. *Id.* ¶ 5, at 6. Alabama had an approved SIP for PSD permitting during the relevant time. *Id.* ¶ 7, at 5. Accordingly, the question as to whether TVA was required to obtain a preconstruction permit for these pollutants at this unit is governed by the

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[64]As noted earlier, the alleged violation with respect to SO_2 emissions of the nonattainment NSR permitting requirements for Colbert Unit 5 will be discussed below in Part III.E.

[65]TVA argues that Colbert Unit 5 is exempt from the permitting requirements for NO_X and TSP under the PSD requirements of the state SIP on the grounds that construction of the physical changes was commenced within 18 months of August 7, 1980, and TVA had all of the federal, state and local preconstruction permits necessary under the SIP before that date. TVA Post-Hearing Brief at 56-60. This contention must fail. The exception upon which TVA relies is only applicable if TVA had all required preconstruction permits. ADEM Reg. 16.4.8(d)(5)(i)(ii) (Regulation Stipulation tab 14). As we conclude below in Part III.E, TVA was required to obtain a preconstruction nonattainment NSR permit for SO_2 emissions, which TVA failed to obtain. Accordingly, TVA did not have all required preconstruction permits as of August 7, 1980, or as of any other time. Moreover, TVA has not shown by record evidence that "on-site construction" commenced within 18 months of August 7, 1980. *See, e.g.,* Memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management, U.S. EPA, to U.S. EPA Regional Administrators at 1 (Dec. 18, 1975) (memorandum regarding interpretation of "Commencement of Construction"). Further, TVA has not demonstrated that the contracts to which it refers, as proof of construction commencement, were for "continuous on-site construction" commencing as of an identifiable date. *See, e.g.,* Memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management, U.S. EPA, to U.S. EPA Regional Administrators at 1 (Apr. 21, 1976) (memorandum regarding interpretation of "Commencement of Construction").

applicable Alabama SIP provisions on PSD identified in the Regulation Stipulation ¶ 7, at 5.

Next, we begin our analysis of the parties' arguments regarding the emissions increase test applicable to the federal and state PSD and nonattainment NSR permitting programs by reviewing the applicable regulatory texts.

2. *Regulatory Emissions Increase Test: the "Actual-to-Potential" Test*

Throughout this discussion, because the state SIPs generally follow the federal NSR programs,[66] we will focus primarily on the federal PSD program requirements and identify in the citations or footnotes the parallel requirements under the state SIPs. For the federal PSD program, our discussion will be based upon the 1984 version of the Code of Federal Regulations. The parties have stipulated that the 1984 version of the Code of Federal Regulations contains the text applicable to the violations at Paradise Units 1, 2, and 3 with respect to NO_X emissions. These regulations are not directly applicable to any of the other violations, which are governed instead by the provisions of the state SIPs.

The federal PSD regulatory definition of "major modification" states that, to be included within the definition, a physical or operational change at the source must "result in a significant *net emissions increase*." 40 C.F.R. § 52.21(b)(2)(i) (emphasis added).[67] The phrase "net

[66]As noted previously, the Alabama SIP's emissions increase test for the nonattainment NSR program prior to its amendment in 1983 was similar to the federal NSPS emissions increase test, not the federal PSD test. These pre-1983 nonattainment NSR provisions are only applicable to SO_2 emissions at Colbert Unit 5, which will be discussed in Part III.E below along with the alleged NSPS violations at Colbert Unit 5.

[67]Regulation Stipulation tab 1, § 16-77 (S1200-3-9-.01(4)) (Tennessee, Memphis/Shelby County); *id.* tab 2 (1200-3-9-.01(4)) (Tennessee); *id.* tab 14, § 16.4.2 (Alabama); *id.* tab 15, § 16.4.2 (Alabama); *id.* tab 15, § 16.3.2 (Alabama).

emissions increase" is separately defined in the regulations to require consideration of both "any increase in *actual emissions* from a particular physical change or change in method of operation" and any other "creditable" increases or decreases in actual emissions at the source within a "contemporaneous" period. *Id.* § 52.21(b)(3) (emphasis added).[68] The issues in the present case concern the first part of this definition (actual emissions from the physical change) and, thus, we need not discuss further the second part (creditable contemporaneous increases or decreases elsewhere at the source).[69]

The phrase "actual emissions" as used in the definition of "net emissions increase" is further defined in section 52.21(b)(21).[70] Generally, the definition of "actual emissions" requires calculation of the actual emissions prior to the physical or operational change, commonly known as the "baseline," which then is compared to the projected[71] emissions after the change. As explained more fully below, the regulations contemplate that the calculation of the pre-change emissions will be based upon data regarding the actual emissions during a two-year period prior to the change that is "representative" of normal operations. In contrast, with respect to the post-change emissions, EPA Enforcement has argued that, under certain circumstances, the post-change emissions are calculated based upon the changed unit's potential to emit.

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[68]For state SIP provisions, see *supra* notes 25, 67.

[69]TVA has argued that if it is required to submit permit applications for these projects, it should not be precluded from proposing increases or decreases elsewhere at the source. TVA Post-Hearing Brief at 108-10. These arguments will be considered below in Part III.G, where we address the Compliance Order's requests for relief.

[70]For state SIP provisions, see *supra* notes 25, 67.

[71]TVA argues that the post-change emissions should be calculated based on actual post-change operating data, rather than a projection of post-change emissions based on the information available to TVA at the time. This argument will be considered below in Part III.D.5.

During the time of the alleged violations in this case,[72] the definition of "actual emissions" stated in relevant part as follows:

> (i) Actual emissions means the actual rate of emissions of a pollutant from an emissions unit, as determined in accordance with paragraphs (b)(21)(ii)-(iv) of this section.
>
> (ii) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operations * * *.
>
> * * * *
>
> (iv) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

40 C.F.R. § 52.21(b)(21)(i), (ii), (iv) (1984).[73] Under this definition, the pre-change "baseline" actual emissions are determined by the emission unit's recent operating history, as specified in subsection (ii). In this case, for the baseline calculation, the parties dispute whether the proper period is the two-year period immediately prior to the physical change or the two-year period with the highest emissions within the five years immediately prior to the modifications. These arguments will be discussed below in Part III.D.3.

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[72]The definition of "actual emissions" was amended in 1992 to, among other things, add an additional concept of "representative actual annual emissions." 57 Fed. Reg. 32,314 (1992). These amendments, however, are not directly applicable in this case as they were not incorporated by the relevant states into their SIPs at the time when TVA commenced construction of its projects.

[73]For state SIP provisions, see *supra* notes 25, 67.

With respect to the post-change "actual emissions," EPA Enforcement contends that the Agency consistently interpreted this pre-1992 definition to require a unit affected by a physical or operational change to be subject to subsection (iv). EPA Enforcement states that since the calculation would be performed before the unit had "begun normal operations" following the change, the unit's post-change "actual emissions" are presumed to be equivalent to the unit's "potential to emit." *See* 45 Fed. Reg. 52,676, 52,677 (1980) ("[T]he source owner must quantify the amount of the proposed emission increase. This amount will generally be the potential to emit of the new or modified unit."). This method of calculating the emissions increase by comparing actual emissions prior to the change with post-change potential emissions is commonly referred to as the "actual-to-potential" test.

TVA argues, on the other hand, that we should apply the reasoning of the Seventh Circuit in the *WEPCO* case and bar the use of post-change "potential" emissions. Instead, according to TVA, we should require use of post-change "actual" emissions in calculating whether the change resulted in an emissions increase. The parties' arguments on this issue will be discussed below in Parts III.D.4 and D.5.

In addition, TVA argues that the manner in which Congress enacted the PSD program in 1977 evinces an intention to incorporate a statutory requirement that any emissions increase be determined based upon whether the change resulted in an increase in the maximum hourly rate of emissions. Because this argument is presented as an issue arising under the statute, which TVA alleges must be applied independent of the regulatorily prescribed test, we will discuss this issue first.

Before turning to the parties' arguments, one additional aspect of the regulations must be noted. As noted above, the parties' arguments focus on the phrase "net emissions increase" and the subsidiary definitions that must be considered to understand its meaning. This phrase, as it is used in the definition of "major modification," is qualified by the word "significant." 40 C.F.R. § 52.21(b)(2) (referring to a "significant net emissions increase"). The term "significant" is separately defined in section 52.21(b)(23) as generally meaning 40 tpy

of NO_X, 40 tpy of SO_2, and 25 tpy of PM. Thus, for PSD and nonattainment NSR purposes generally,[74] any predicted emissions increase must exceed these amounts in order for the permitting requirements to be triggered.

3. *TVA's Argument That the Statute Requires EPA to Demonstrate an Hourly Emissions Increase*

TVA argues that when Congress amended the CAA in 1977, it intended EPA's long-standing regulatory interpretation of the statutory definition of "modification" in the NSPS context to be applied to the newly created PSD program. TVA thus contends that EPA's regulatory interpretation developed for the NSPS program was, in effect, incorporated into the statutory requirements of the PSD program. TVA devotes considerable discussion in its briefs developing this issue, and we now consider those arguments.

TVA first notes that the definition of "modification" set forth in CAA § 111(a)(4) was originally enacted in 1970, and that EPA's initial regulations promulgated under this definition for the purposes of the NSPS program required measurement of emissions increases in terms of the unit's "emissions rate." TVA also observes that, in the mid-1970s, when EPA first proposed to create a PSD program by regulation (prior to the mandate for such a program in the 1977 CAA amendments), EPA also proposed that an emissions increase be measured based on the unit's "emissions rate." *See* TVA Response to Initial Brief at 57 & nn.44-45, (citing 39 Fed. Reg. 36,946 (1974); 39 Fed. Reg. 42,514 (1974)). It argues further that emissions rate means the unit's maximum hourly emissions rate. TVA Reply Brief at 32. Accordingly, TVA claims that when Congress amended the CAA in 1977 to create the statutory PSD and nonattainment NSR programs, it legislated in a context where EPA had uniformly interpreted the emissions increase requirement of the term "modification" to be measured based on the unit's maximum hourly rate of emissions.

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[74]For state SIP provisions, see *supra* notes 25, 67.

In particular, TVA states that in 1977, when Congress amended the CAA:

> Congress incorporated into its definition of "construction" for purposes of the new NSR program the term "modification," as that term was defined under CAA § 111, and as that term had been consistently interpreted by EPA in contemporaneous interpretations announced between 1971 and 1977 under the NSPS and NSR rules. Specifically, following initial enactment, in which the NSR provisions had been made to apply *only* to newly-constructed sources, a technical amendment [later in 1977] was made to the NSR program provisions, in which Congress said that the term "'construction' when used in connection with any source or facility *includes the modification (as defined in section 7411(a)* of this title) of any source or facility."
>
> The legislative history of the technical amendment explains that the change was made in order to "[i]mplement[] [the] conference agreement to cover 'modification' as well as 'construction' by defining 'construction' in part C to conform to *usage in other parts of the Act*."

Id. at 58 (citations and footnote omitted) (quoting CAA § 169(2)(C), 42 U.S.C. § 7479(2)(C) (emphasis added by TVA); 123 Cong. Rec. H11957 (daily ed. Nov. 1, 1977) (emphasis and alterations added by TVA)). Based upon this background, TVA concludes, "[I]t is clear that Congress intended that only a NSPS modification at an existing unit is 'construction' activity that can subject an existing unit to potential NSR permitting as a result of a 'physical or operational' change." *Id.* at 60.[75]

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[75]TVA reasserts this same argument in its post-hearing briefs. *See* TVA Post-Hearing Brief at 29, 31-33.

In essence, TVA argues that the statutory definition for the PSD program of "construction," CAA § 169(2)(C), 42 U.S.C. § 7479(2)(C), which references "modification" as defined in CAA section 111, contains within it a requirement that there must be an increase in the maximum hourly emissions rate of the unit. Carried to its logical conclusion, this argument suggests that any NSR regulation promulgated by EPA which ignored this maximum hourly emissions rate would be incompatible with the statute. As explained below, we reject this argument as nothing other than an untimely challenge to EPA's 1980 PSD regulations, which plainly established an emissions test based upon the unit's actual emissions (expressed as an average rate measured in tons per year) during the period prior to the physical or operational change and without reference to whether there was also an increase in the maximum hourly emissions rate.

As noted above, the federal regulations provide that a permit is required if the physical change results in a "significant net emissions increase." 40 C.F.R. § 52.21(b)(2)(i).[76] "Net emissions increase" in turn is defined as an increase in "actual emissions," *id.* § 52.21(b)(3), and that term is defined as "equal to the *average rate, in tons per year,* at which the unit actually emitted pollutants during a two-year period which precedes" the physical change. *Id.* § 52.21(b)(21)(ii) (emphasis added).[77] Briefly stated, the PSD regulations require consideration of the actual amount, measured in tons per year and expressed as an average annual rate, of pollution emitted by the source prior to the change and to be emitted after the change, whereas the NSPS maximum hourly emissions rate test looks to the maximum rate at which the source can emit on an hourly basis. These differences and the shift in focus from potential hourly emissions rate to actual emissions, in tons per year, was thoroughly explained in the preamble to the rulemaking by which the PSD test was promulgated. *See* 45 Fed. Reg. 52,676, 52,700 (1980).

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[76]For state SIP provisions, see *supra* notes 25, 67.

[77]For state SIP provisions, see *supra* notes 25, 67.

By arguing that the NSPS hourly emissions rate test must be applied as an initial step in the PSD or nonattainment NSR permitting context, TVA in effect challenges the emissions test required by the Agency's duly promulgated regulations. However, we have frequently stated that we will not generally entertain challenges to the Agency's regulations in the context of an enforcement or permit proceeding. *See In re B.J. Carney Indus.*, 7 E.A.D. 171, (EAB 1997) (enforcement proceeding), 192 F.3d 917 (9th Cir. 1999), *vacated as moot*, 200 F.3d 1222 (9th Cir. 2000); *In re Echevarria*, 5 E.A.D. 626, 634 (EAB 1994) (enforcement proceeding); *In re Puna Geothermal Venture*, UIC Appeal Nos. 99-2 to -5, slip op. at 9 n.7 (EAB, June 27, 2000), 9 E.A.D. ___ (challenges to regulations not entertained in a permitting proceeding); *In re City of Port St. Joe*, 7 E.A.D. 275, (EAB 1997) (same); *In re Suckla Farms, Inc.*, 4 E.A.D. 686, 698 (EAB 1993) (same); *In re Ford Motor Co.*, 3 E.A.D. 677, 682 n.2 (Adm'r 1991) (same). We see no compelling reason to depart from this principle here. Accordingly, TVA's arguments are rejected as untimely challenges to the Agency's PSD regulations (and the EPA-approved SIPs).

We also reject TVA's argument because a plain reading of the statutory text makes clear that the CAA is not limited in the manner argued by TVA. Indeed, there is no suggestion in the language of the statute itself that an emissions increase must be measured as "maximum hourly emissions rate." The statutory text merely refers to "*increase*[] [in] the *amount* of any air pollutant emitted." CAA § 111(a)(4), 42 U.S.C. § 7411(a)(4) (emphasis added). It does not specify how an increase is to be measured (whether by maximum hourly rate as suggested by TVA or by tons per year as stated in the PSD and nonattainment NSR regulations or by any other method), or even use the words "hourly" or "emission rate." *Cf.* 40 C.F.R. § 52.21(b)(21)(ii). Had Congress intended to restrict the Agency's discretion in this respect, it surely would have stated this limitation expressly in language far more limiting than the provision it chose to enact into law.[78]

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[78]EPA Enforcement has suggested that, under the statutory definition, emissions could be measured by any of the following: "the unit's actual emissions, its maximum (continued...)

TVA has cited no case, Agency interpretation, or other authority published in the nearly twenty-five years since the enactment of the 1977 CAA amendments for its novel argument that the statutory definition must be interpreted for both the NSR and NSPS programs to require measurement of emissions as a "maximum hourly emissions rate." To the contrary, there are numerous instances in which EPA and the courts have stated that the emissions increase test is different for the two programs. *See, e.g., WEPCO,* 893 F.2d at 905, 913;[79] *Puerto Rican Cement Co. v. EPA*, 889 F.2d 292, 298 (1st Cir. 1989); Letter to Timothy J. Method, Assistant Commissioner, Indiana Department of Environmental Management, from David Kee, EPA Director of Air and Radiation Division at 2-4 (Jan. 30, 1990)*; see also Alabama Power*, 636 F.2d 323, 397-98 (D.C. Cir. 1980) (holding that, even though the same statutory definition of the term "source" in CAA § 111 applies to the NSPS program and the PSD programs, EPA may define the "component terms" used within section 111's definition differently because of differences in the purposes and structure of the two programs).

Moreover, we see nothing in the statutory text, legislative history, or the circumstances of the 1977 amendments cited by TVA that would compel us to interpret the statutory definition more narrowly than the court applied in *WEPCO*. In that case, the court specifically observed that "each program [NSPS and PSD] measures emissions in a

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[78](...continued)
theoretical potential to emit, its present (that is, considering deterioration) potential to emit, its permitted allowable emissions, or any other measure." EPA Enforcement Post-Hearing Brief at 133.

[79]In discussing the statutory emissions increase requirement, the Seventh Circuit stated that arguments regarding "emission rates" arise under the regulations, not under the statute itself. *WEPCO,* 893 F.2d at 910. The court then held as follows: "For purposes of the statutory requirement, we simply observe that the rejuvenated Port Washington plant will *produce more emissions* after the completion of the renovation project than the operating deteriorated plant produced shortly before the project was undertaken." *Id*. (emphasis added). In so holding, the court noted that WEPCO had admitted that the "replacement program" would enable its "deteriorated generators to operate at full capacity," which would cause emissions to "increase from their current operating levels." *Id.*

fundamentally distinct manner." *WEPCO,* 893 F.2d at 913. We certainly see no requirement that measurement of an emissions increase may only be based on "maximum hourly emissions rate."

EPA has chosen, through its regulations, to advance the technology centered purposes of the NSPS for steam generating boilers by measuring emissions increase based on maximum hourly emissions rate, and to advance the locality centered purposes of the PSD and nonattainment NSR programs by measuring emissions based on tons per year. *Compare* 40 C.F.R. § 60.14, *with* 40 C.F.R. §§ 51.24(b)(4), 52.21(b)(4); *see also Northern Plains Resource Council v. EPA*, 645 F.2d 1349, 1356 (9th Cir. 1981)).[80] As noted above, the propriety of that regulatory choice, made more than twenty years ago, may not be reviewed in this case and, in particular, we see no reason to interpret the statutory definition of "modification" as compelling the use of "maximum hourly emissions rate" as a predicate to both programs.

Thus, we reject TVA's argument that Congress' cross-reference

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[80]TVA argues that EPA acknowledged the existence of an hourly emissions rate requirement by excluding "an increase in the hours of operation or in the production rate" from "physical change or change in the method of operation." *See* 40 C.F.R. § 52.21(b)(iii)(f). This argument, however, has no merit –- it is not only incompatible with a plain reading of the "hours of operation" exception, but it also has been rejected by the EPA and by two federal circuit courts. In particular, the Seventh Circuit stated as follows:

> Despite WEPCO's protestations, we note initially that the EPA's refusal to apply the "production rate/hours of operation" exclusion was proper. This exclusion – which states that "[a] physical change or change in the method of operation shall not include * * * [a]n increase in the hours of operation or in the production rate," – was provided to allow facilities to take advantage of fluctuating market conditions, not construction or modification activity.

WEPCO, 893 F.2d at 916 n.11 (quoting 40 C.F.R. § 52.21(b)(iii)(f)) (modifications made by the court) (citations omitted); *see also Puerto Rican Cement Co. v. EPA*, 889 F.2d 292, 298 (1st Cir. 1989). In sum, the Agency for many years has interpreted the hours of operation/production rate exception as applicable to operational changes where there is no other change such as the physical changes made by TVA at issue in this case.

in the PSD portion of the CAA to the definition of "modification" in the NSPS portion of the statute ensconced the NSPS regulatory emissions increase test as a fixed and immutable emissions test applicable to the PSD or other NSR programs. Next, we turn to the parties' arguments arising under the terms of the regulations themselves, beginning with the arguments regarding calculation of the pre-change "baseline" emissions.

4. *Base-line Emissions Issues*

As noted earlier, the regulatory definition of "actual emissions" which is used in the definition of "net emissions increase" contemplates the comparison of the *average emissions, in tons per year,* during a pre-change "baseline" period to the emissions after the change. In this part of our discussion, we will consider the parties' arguments regarding the proper method for calculating the emissions in the baseline period. For ease of reference, the applicable regulatory text is as follows:

> In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operations * * *.

40 C.F.R. § 52.21(b)(21)(ii).[81]

EPA Enforcement argues that the baseline emissions must be based upon the two-year period that immediately precedes the particular physical change. EPA Enforcement Post-Hearing Brief at 117-21. EPA Enforcement contends that the regulation quoted above establishes a presumption that the two-year period immediately before the physical change is representative of normal operations. *Id.* at 117-18. It argues that this presumption is explained in an Agency guidance document. *See*

[81]For state SIP provisions, see *supra* notes 25, 67.

id. at 118 (citing *New Source Review Workshop Manual* at A.39 (draft Oct. 1990));[82] EPA Enforcement Reply Brief at 26. EPA Enforcement concludes that, if TVA believes that the immediately preceding two-year period is not representative, "TVA must persuade the Board that any alternative period is more representative of unit emissions." EPA Enforcement Post-Hearing Brief at 117.

Although the parties extensively argue whether a rebuttable presumption exists in favor of one baseline period over another, we conclude that any such rebuttable presumption would have no effect on our ruling here, as TVA's evidence is sufficient to overcome any such presumption.

EPA Enforcement's witness, Mr. Van Gieson, testified, based on a review of certain data regarding these units, including the monthly operating statistics reports, that "there is nothing to suggest that the two year time period before the [project] did not represent normal source operations." EPA Enforcement Ex. 277, at 31 (Van Gieson pre-filed testimony). As EPA Enforcement argued in its briefs, given the steady deterioration of the units involved, and the associated progressive decline in unit performance, it was reasonable, absent other information, to look at the period immediately prior to the change as indicative of the unit's

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[82]The New Source Review Workshop Manual was issued as a guidance document for use in conjunction with new source review workshops and training, and to guide permitting officials with respect to PSD requirements and policy. Although it is not accorded the same weight as a binding Agency regulation, the Manual has been looked to by this Board as a statement of the Agency's thinking on certain PSD issues. *See, e.g., In re Steel Dynamics, Inc.*, PSD Appeal Nos. 99-4 & 99-5, slip op. at 12 n.8 (EAB, June 22, 2000), 9 E.A.D. ___; *In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 98-22 to -24, slip op. at 9 n.7 (EAB, Nov. 25, 1998), 8 E.A.D. __; *In re Masonite Corp.*, 5 E.A.D. 551, 558 n.8 (EAB 1994). As noted by EPA Enforcement, the New Source Review Workshop Manual provides guidance that the two years immediately prior to the change is presumed to be the representative period. In contrast, the preamble to the 1992 amendments to the NSR regulations suggests that any two-year period within the previous five years may be representative. 57 Fed. Reg. 32,314 (1992). We need not decide which of these two presumptions controls at the time of the various projects at issue in this case, as TVA's evidence is sufficient to overcome any such presumption, as discussed in the text.

operational capacity at the time of the change. EPA Enforcement Reply Brief at 26. Thus, although Mr. Van Gieson's testimony does not eliminate the possibility that another time period might be more representative, it provides some evidence that the two-year period immediately preceding the physical changes at issue is "representative" in this case, and, even if EPA Enforcement were not entitled to the benefit of a presumption, it nevertheless produced sufficient evidence to establish a *prima facie* case regarding its proposed baseline period. In any case, TVA's evidence is sufficient to rebut this evidence and any suggested presumption.

TVA introduced evidence to establish that, at least for some of the units,[83] another two-year period was more representative of normal source operations. TVA's witness, Mr. Houston, testified that "the 24-month period having the highest annual emissions rate during the five years preceding the project [is] the baseline period representative of normal operations." TVA Ex. 9 at 5 (Houston pre-filed testimony).

Mr. Houston testified that he used the "high two-of-five" period as representative of normal operations because it would take into account "any fluctuations in utilization of the unit that may be due to various factors, such as weather, availability of other units on the system, etc." *Id.* Mr. Houston further testified that it is TVA's goal to operate its coal-fired generators to achieve full capacity. *Id*. at 4; Tr. at 950. He also testified that he chose the high emissions period as the representative period because "generally the closer the operation is to normal is going to mean the emissions are going to be higher with more operations." Tr. at 950. In its post-hearing brief, TVA explains the import of Mr. Houston's testimony as follows:

> In other words, by using the high 2 of 5 period as the baseline period, which varies from unit to unit depending upon the particular conditions of the unit

[83]For several of the units, TVA's evidence established that the appropriate baseline period is the two-year period immediately preceding the physical changes at issue. *See* TVA Ex. 9, atts. 10 (Allen Unit 3), 12 (Cumberland Unit 1).

> during the 5-year period before the change, one would avoid the likelihood that factors wholly independent from the project or the conditions of the unit before the project – such as weather and availability of other units on the system, i.e. independent demand factors – would affect the operation of the unit during the baseline period.

TVA Post-Hearing Brief at 73-74.

In its post-hearing brief, EPA Enforcement attempts to discredit Mr. Houston's testimony by noting that "Mr. Houston ignores the fact that these units were deteriorating at a steady rate, so that although TVA would have preferred to run the units at a higher capacity, normal operations of the unit did not reach those levels." EPA Enforcement Post-Hearing Brief at 26. While EPA Enforcement's observation that these units were generally deteriorating is established by the record in this case,[84] EPA Enforcement did not introduce any evidence to establish, for example, that for those units with emissions in the two-year period immediately preceding the physical changes that were lower than the emissions in the high-two-of-five period, such lower emissions were more likely the result of deterioration as opposed to other factors such as weather conditions.

TVA has fairly put in question whether the reduced emissions in the two years before the project were not caused by general deterioration, but rather were due to other factors including weather. In sum, TVA introduced evidence explaining why a period other than the first two years prior to the physical changes would be more representative of normal operations and EPA Enforcement has not sufficiently rebutted that evidence, having only introduced testimony that Mr. Van Gieson concluded, based on a review of certain data, that there was "nothing to suggest that the two year time period before the [project]

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[84] *See* App. A.

did not represent normal source operations." EPA Enforcement Ex. 277 at 31 (Van Gieson pre-filed testimony).

Given EPA Enforcement's inability to adduce evidence sufficient to overcome TVA's rebuttal evidence, we conclude, based on the evidence in the record of this case, that the two-year period having the highest emissions in the five-year period preceding the change is the most representative of normal source operations and shall be used as the baseline period for calculation of the pre-change emissions of the fourteen units at issue in this case. Although we rely on Mr. Houston's testimony in concluding that this period is most representative in this case, in our following discussion we will generally refer to Mr. Van Gieson's testimony and emission calculations as his testimony includes coverage of the emissions in this period and provides a clearer comparative framework. Mr. Houston did not provide testimony as to the post-change emissions calculation that, as discussed below, we find appropriate. Although there are some differences between the twenty-four month periods that Mr. Van Gieson and Mr. Houston concluded were the high-two-of-five for specific projects, such differences are not material. In addition, we note that both Mr. Van Gieson and Mr. Houston determined that the high-two-of-five period for some of the projects was, in fact, the two-year period immediately preceding the physical change.

Next, we turn to the issues regarding calculation of emissions attributable to the post-change period.

5. *Issues Regarding Post-Change Emissions: WEPCO Decision and Other Issues*

As noted above, the Agency historically has interpreted the definition of "actual emissions" as requiring post-change emissions for a unit that has been subject to a physical or operational change to be measured as the unit's potential to emit. In particular, the Agency has generally interpreted changed units as subject to subpart (iv) of the definition of "actual emissions." For ease of reference, that subpart states as follows:

> (iv) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

40 C.F.R. § 52.21(b)(21)(iv) (1989).[85] This subpart has been viewed as applicable to changed units under the notion that, when the preconstruction prediction of emissions is made, the unit to be affected by the change has not "begun normal operations" as a changed unit. As noted earlier in this decision, the method of calculating emissions increase based on these regulations as advocated by EPA Enforcement is referred to as the "actual-to-potential" test.

TVA argues in the present case that the actual-to-potential test for calculating whether an emissions increase will result from a physical change should not be applied to the changes made to the fourteen units at issue here. TVA first argues that, in *WEPCO,* the Seventh Circuit rejected application of the actual-to-potential test for replacement projects allegedly similar to those at issue in this case. *See* TVA Post-Hearing Brief at 63-66; *WEPCO*, 893 F.2d 901 (7th Cir. 1990). Second, TVA argues that it is inappropriate in a case, such as this one, arising years after the physical changes were completed, for the post-change emissions to be calculated based on a hypothetical projection of emissions (which we will refer to as a "retrospective prediction" method), when the post-change emissions can be calculated based on evidence of the post-change operations (we will refer to such a test based on operating data as a "actual-to-confirmed-actual" test). TVA Post-Hearing Brief at 66-71. These issues are discussed below.

a. *The Actual-to-Potential Test: WEPCO and the Region's Allegations in the Compliance Order*

As noted, TVA argues that we should adopt the analysis used by the Seventh Circuit in *WEPCO,* 893 F.2d 901 (7th Cir. 1990), and reject EPA Enforcement's analysis based on the actual-to-potential test. In the *WEPCO* case, the Seventh Circuit did not uphold the Agency's application of the actual-to-potential test to what the court referred to as

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[85]For state SIP provisions, see *supra* notes 25 & 67.

proposed "like-kind replacements" at a facility that had an extensive history of prior operations. Instead, noting that it had concerns regarding the "assumption of continuous operations" for a unit that had a prior operating history, the Court stated that "the EPA's reliance on an assumed continuous operation as a basis for finding an emissions increase is not properly supported." *Id.* at 918.

The projects at issue in WEPCO involved substantial renovations of five 80-MW coal-fired generating units at WEPCO's Port Washington electric power plant. All five of the units had experienced significant age-related deterioration that prevented them from being operated at their original capacity. *Id.* at 905-06. Indeed, one of the units, Unit 5, had been shut down completely due to the possibility of catastrophic failure if it were operated. *Id.* WEPCO's proposed renovation project would have enabled all five units "capable of generating at [their] designed capability until year 2010." *Id.* at 906.

When the court turned to its review of the Agency's determination that the proposed renovation projects would result in a "significant net emissions increase" under the PSD regulations, the court noted that "[i]n calculating the plant's post-renovation potential to emit, the EPA bases its figures on round-the-clock operations (24 hours per day, 365 days per year) because WEPCO could potentially operate its facility continuously, despite the fact that WEPCO has never done so in the past." *Id.* at 916. With this background, the court noted that it was "troubled by the EPA's assumption of continuous operations." It also stated, however, that "EPA cannot reasonably rely on a utilities' own unenforceable estimates of its annual emissions." *Id.* at 917. Nevertheless, it concluded that "we find no support in the regulations for the EPA's decision to wholly disregard past operating conditions at the plant." *Id.* It therefore held that "the EPA's reliance on an assumed continuous operation as a basis for finding an emissions increase is not properly supported." *Id.* at 918.

In the present case, TVA argues that use of the actual-to-potential test was "expressly repudiated by the Seventh Circuit in *WEPCO*," TVA Post-Hearing Reply Brief at 38, and that the *WEPCO* holding must be followed by the Board. *Id.* at 38 n.38. In contrast, EPA Enforcement argues that we should apply an actual-to-potential test in this case. EPA Enforcement Post-Hearing Brief at 73-90, 116-61; EPA

Enforcement Initial Brief at 34-49. With respect to the Seventh Circuit's WEPCO decision, EPA Enforcement contends that (1) *WEPCO* is distinguishable from this case in that TVA intended the projects at issue in this case to restore lost generating capacity, which TVA intended to use (EPA Enforcement Post-Hearing Brief at 143-44, 152), (2) the Seventh Circuit's reasoning is faulty in several respects (*id.* at 147-48), and (3) by its 1992 rulemaking, known as the "WEPCO Rule," EPA formally determined, through notice and comment rulemaking, the circumstances in which an "electric utility steam generating unit" may use a test other than the actual-to-potential test for determining the post-change emissions of the changed unit. *Id.* at 146-47, 150-52.

While the parties have devoted considerable time in their briefs arguing the applicability of the Seventh Circuit's analysis to this case, we conclude that it is unnecessary for us to decide these issues. In the present case, notwithstanding EPA Enforcement's advocacy of the appropriateness of an actual-to-potential test in the context of this reconsideration, we decline to apply that test because of the way that the Region, in the exercise of its enforcement discretion, framed the test in its Compliance Order. In particular, the Compliance Order, as amended on April 10, 2000, states that "[i]n determining whether a significant emissions increase has resulted from a major modification in the case of electric utilities, actual pre-modification emissions are compared with *projected actual* emissions after the modification." Compliance Order ¶ 18 (citing *WEPCO*, 893 F.2d 901 (7th Cir. 1990)) (emphasis added). This statement is part of the Region's notice to TVA of the rules and regulations that it is accused of having violated and, as such, provided TVA with notice of the Region's theory of its case. While EPA Enforcement's briefing of the actual-to-potential test can be viewed as, in effect, a request for us to disregard the Region's statement in the Compliance Order of its view of the applicable emissions test, nevertheless, we are disinclined to hold TVA to a more rigorous[86]

[86]The actual-to-potential test is a more rigorous standard in this case than the other proposed methods of calculating the post-change emissions increase because EPA Enforcement's evidence uniformly established higher emissions under the actual-to-potential method than under the other proposed methods. *See* EPA Enforcement Exs. 175-88.

standard than was alleged in the Compliance Order.[87] Accordingly, we reject EPA Enforcement's proposed use in this case[88] of the actual-to-potential method of calculating the alleged emissions increase.[89]

b. *After-the-Fact "Projection" of Emissions vs. Evidence of Post-Change Emissions*

EPA Enforcement apparently anticipated the possibility that it might be precluded from using the actual-to-potential test in that it introduced evidence of the alleged emissions increases based on what we will refer to generally as a retrospective prediction or, when discussing the particular methodology used by Mr. Van Gieson, as an actual-to-projected-actual test. *See* EPA Enforcement Exs. 175-88; EPA Enforcement Post-Hearing Brief at 153-62. EPA Enforcement's proposed projection of post-change emissions are based upon what it believes "should have been put into a NSR permit application had TVA applied for a permit" prior to making the particular physical changes at issue. EPA Enforcement Post-Hearing Brief at 156. To make its "projections," EPA Enforcement used "relevant information" that was available to TVA and shows either TVA's own "specific numeric predictions of a unit's operations after the project" or "information about component performance and loss in generating ability of the unit due to the component's failures." *Id.* at 157.

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[87] Although this statement in the Compliance Order may not be a legal bar to application of a different test, we do not believe under the circumstances of this case that EPA Enforcement should on reconsideration be permitted to alter a foundational premise of the order that we are reconsidering, and change such a fundamental component of its theory of the case in a way that inures to its benefit.

[88] TVA's arguments that it did not have "fair notice" of the alleged applicability of the actual-to-potential method, *see* TVA Post-Hearing Brief at 99-107, are moot because we have rejected application of the actual-to-potential method in this case. Further, TVA has not argued that it lacked fair notice of emissions increases calculated based upon a projection of post-change emissions (nor could it, because a preconstruction permit application must, at a minimum, contain such projections).

[89] We express no view as to whether the actual-to-potential test would or would not be appropriate in other cases.

In contrast, TVA argues that it is inappropriate in a case such as this one, arising years after the physical changes were completed, to calculate post-change emissions based on a hypothetical projection of emissions, when the post-change emissions can be discerned from evidence of the post-change operations that in fact occurred. TVA Post-Hearing Brief at 66-71. (We will refer to TVA's proposed test based on post-change operating data as an "actual-to-confirmed-actual" test.) TVA articulates this argument as follows:

> EPA Enforcement's reasoning has no place in an enforcement action, where EPA Enforcement is alleging a violation of NSR requirements *after* the fact. In an enforcement action, such as this case, EPA Enforcement has actual data of pre-project as well as post-project emissions. It simply makes no sense for EPA Enforcement to "project" a unit's actual emissions after the project (based on an unrealistic set of assumptions) in calculating "[a]ny increase in *actual* emissions from a particular" physical or operational change (40 C.F.R. § 52.21(b)(3)(i)), when EPA Enforcement has actual emissions data for both the pre-project and post-project periods. *See* Tr. at 519. Certainly, projections based upon assumptions cannot be considered best evidence.

TVA Post-Hearing Brief at 65 (emphasis added by TVA).

TVA's argument that this proceeding should look to historical post-change operating data, rather than hypothetical projections, must be rejected as contrary to the requirements of the CAA and applicable NSR regulations. Initially, it is worth noting that the only authority TVA cites for its argument is one part of the regulations that interprets and elaborates upon the statutory definition of "modification." TVA Post-Hearing Brief at 65 (citing 40 C.F.R. § 52.21(b)(3)(i)).[90] We conclude

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[90]The particular regulatory text cited by TVA was promulgated to elaborate upon the emissions increase requirement of the statutory definition of "modification." The regulatory text cited by TVA appears at 40 C.F.R. § 52.21(b)(3)(i), which is the definition of "net emissions increase." The term "actual," as used in this context, was intended to signal a departure from reliance on "potential emission rate" and has no bearing upon the choice in an enforcement context as to whether post-change emissions (continued...)

that these regulatory terms and phrases cannot be read in isolation, but must be interpreted and applied in light of the statutory and regulatory architecture and, in particular, in the context of the violations alleged in the Compliance Order.

First, we note that the Compliance Order was issued pursuant to CAA § 113, 42 U.S.C. § 7413, which authorizes the Administrator to issue orders directing compliance with the CAA,[91] as well as CAA § 167, 42 U.S.C. § 7477, which directs the Administrator to take such measures as necessary "to prevent construction or modification" of a nonconforming facility. Because the Act specifically contemplates that an enforcement action to prevent construction may be brought before modification of a facility is complete, Congress must have intended the determination in such an enforcement action to be based upon projections of emissions increases.[92]

Moreover, the preconstruction permitting requirements also contemplate that the source owner must decide whether to apply for a permit based upon predictions of whether the emissions increase from a physical change will exceed the applicable significance levels after the change has been made. The applicable significance level for NO_X and SO_2 is 40 tpy; for PM it is 25 tpy.[93] As demonstrated below, a violation of the requirement to obtain a preconstruction permit brought after the physical change has been completed must also be determined based on the same standards as would apply in either the permitting context or the enforcement context where construction has not been completed –

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[90](...continued)
are to be calculated based upon either a hypothetical projection of post-change emissions or data regarding the post-change operations. *See* 45 Fed. Reg. at 52,700.

[91]More specifically, the Compliance Order alleges that TVA violated the CAA's requirement that it obtain NSR permits before beginning "construction." Compliance Order ¶¶ 57, 67, 82 (citing CAA § 165, 42 U.S.C. § 7475, 40 C.F.R. § 52.21(b)(2)).

[92]In an enforcement action brought prior to completion of construction, the consequences of the physical change (that is being constructed) can only be determined by predictions.

[93]*See* definition of "significant" at 40 C.F.R. § 52.21(b)(23) (1984).

namely a prediction of emissions based on the information known before the physical change is made.[94] Our analysis follows.

The statute expressly contemplates that projections of the impact of a change must be made before construction. Before a permit is issued, among other things, the owner or operator of the source must, using projections of post-change emissions, demonstrate that emissions from the modified source will not violate air quality requirements. Specifically, section 165 states that "[n]o major emitting facility * * * may be constructed unless a permit *has been issued* for such *proposed facility*." CAA § 165, 42 U.S.C. § 7475 (emphasis added). Further, the owner or operator must demonstrate that "emissions from construction or operation of such facility will not cause, or contribute to, air pollution in excess of" the NAAQS, among other things. CAA § 165(a)(3), 42 U.S.C. § 7475(a)(3). A permit may not be issued unless "there has been an analysis of any air quality impacts projected for the area as a result of growth associated with such facility." CAA § 165(a)(6), 42 U.S.C. § 7475(a)(6).

Moreover, if a permit is issued containing operating or other restrictions based upon the results of these predictions, the permit restrictions cannot be removed even when the post-change operations demonstrate that the predictions were erroneous. *Hawaiian Elec. Co. v. EPA*, 723 F.2d 1440, 1446 (9th Cir. 1984) ("Nothing in the Clean Air Act or its legislative history indicates that Congress intended that EPA should have to reconsider each and every PSD permit if modeling predictions were subsequently drawn into question.").

This statutory and regulatory structure has two important features relevant to the present discussion: (1) the permit must be obtained *before* the physical change is made, and (2) whether a physical change requires a permit is determined in part by reference to anticipated results or consequences, which necessarily would occur *after* the physical change is made. Thus, the only way for the owner or operator

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[94]In particular, the violation at issue (failure to obtain a preconstruction permit) is determined based in part upon whether the change (that requires a permit) results in an emissions increase. CAA § 111(a)(4), 42 U.S.C. § 7411(a)(4); 40 C.F.R. § 52.21(b)(2)(i) (1984) (major modification means any "physical change * * * that *would* result in a significant net emissions increase") (emphasis added).

of the source to know whether a permit is required for any particular physical change is for the owner or operator to make a prediction as to whether the emissions increase will occur. This observation was described by EPA in the 1992 preamble to amendments to the NSR regulations as follows:

> Applicability of the CAA's NSR provisions must be determined in advance of construction and is pollutant specific. In cases involving existing sources, this requires a pollutant-by-pollutant projection of the emissions increases, if any, that will result from the physical or operational change.

57 Fed. Reg. 32,314, 32,316 n.8 (1992).

Because the statute and regulations contemplate that the regulated entity must predict future events in order to determine whether a permit is required, we conclude that it is appropriate to base a finding of violation (for failure to obtain the permit) upon what the entity reasonably could have predicted prior to beginning "construction."[95] Any other construction of the statute would turn the preconstruction permitting program on its head and would allow sources to construct without a permit while they wait to see if it would be proven that emissions would increase. Clearly Congress did not intend such an outcome, which would eviscerate the *preconstruction* dimension of the program.

Thus, we find that the question of whether the physical changes made by TVA required a preconstruction permit must be determined based upon evidence regarding projections of emissions increases that should have been performed by TVA before it made the physical changes. However, as we note in the following section (where we will consider EPA Enforcement's evidence regarding its proposed actual-to-

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[95]While the parties have not identified any case law relevant to this issue (which TVA describes as a question of the validity of "retrospective projection") and we are not aware of any in the preconstruction permitting context, it is nevertheless instructive that "retrospective projections" are commonly utilized for determining a party's liabilities in other contexts. *See, e.g., Coleman v. Commissioner,* 53 T.C.M. (CCH) 598 (1987) (determination of tax liability based on "retrospective prediction" of residual value in order to determine whether transaction was properly characterized as lease or sale).

projected-actual test and TVA's challenges to that evidence), the confirmed-actual data may be considered for the limited purpose of either confirming or refuting the *reasonableness* of a particular prediction methodology and for other purposes.

c. *EPA Enforcement's Proof of Emissions Projections and TVA's "Causation" Argument (Demand Growth and Related Issues)*

EPA Enforcement relies primarily on the testimony of Mr. Van Gieson to establish that, prior to the fourteen physical changes made by TVA to nine of its coal-fired units, TVA should have determined that those changes would result in "significant net emissions increases," thereby triggering the PSD and nonattainment NSR permitting requirements. Specifically, EPA Enforcement states as follows:

> These calculations, performed by EPA's expert witness, Mr. Van Gieson, identify the future emissions from the unit that would result from the physical change being completed if a reasonable prediction of net emissions increase had been performed before the change.

EPA Enforcement Post-Hearing Brief at 156. In essence, in the part of his analysis at issue here, Mr. Van Gieson looked back retrospectively to make a prediction, based on information available to TVA prior to the projects, as to what the emissions increases would likely be. This type of calculation we will generally refer to, in our following discussion, as a "retrospective prediction" and the specific analysis performed by Mr. Van Gieson we will refer to as his actual-to-projected-actual method.

In order to predict retrospectively the emissions increase resulting from the physical changes, Mr. Van Gieson referred to two sources of information regarding unit performance: "TVA's own internal documents justifying the construction," which provided an analysis of how some of the units would operate differently after the change, and information about component performance and loss in generating ability due to component failure reported by TVA to the North American Electric Reliability Council's ("NERC") Generating Availability Data System ("GADS"). *Id.* The GADS records contain information submitted by electric power utility owners and operators, including

TVA, regarding instances in which a unit is shut down due to problems with specific parts, or components, of the boiler (called a "forced outage") or where the unit has a reduced operating capacity due to such problems (called a unit "derating"). The GADS records contain information regarding which part of the boiler caused an outage or derating, the start and end time and date, the duration in hours, and the megawatt hour ("MWH") loss of the outage or derating.

For each of the fourteen units at issue in this case, Mr. Van Gieson reviewed the GADS information for the high-two-of-five baseline period[96] and identified the MWH loss attributable to outages and deratings associated with the part of the boiler being altered in the project at the unit. Mr. Van Gieson then "calculated the emissions effect that would occur after the part of the boiler was repaired or replaced and the megawatt hours lost were reduced to zero." *Id.* at 158. Mr. Van Gieson's calculations of the resulting increased emissions are set forth in EPA Enforcement's Exhibits 175-88, identified by the heading "projected Net Representative Future Actual Emissions Increase," and further identified by reference to the high-two-of-five baseline.[97] Mr. Van Gieson's conclusions as to the emissions increase for each unit and each pollutant as to which EPA Enforcement seeks a finding of violation (which we previously identified in Part III.A above)[98] are summarized as follows:

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[96]*See supra* Part III.D.3, discussing our conclusion that the appropriate baseline period, based on the record of this case, is the two-year period with the highest emissions within the five-years immediately prior to the modifications, not the two years immediately preceding the physical changes at issue in this case. Mr. Van Gieson also reviewed the same information for the two-year period immediately preceding the physical change to each unit.

[97]EPA Enforcement's Exhibits 175-88 set forth Mr. Van Gieson's emissions calculations under several different methods, including the actual-to-potential method and calculations of emissions based on post-change operating data, as well as the method discussed in the text (for both the high-two-of-five baseline and the two-year baseline immediately preceding the physical changes).

[98]As noted in Part III.A, EPA Enforcement abandoned allegations as to violations with respect to some of the pollutants at certain units.

Chart No. 4

	NO_X (tpy)	SO_2 (tpy)	PM (tpy)
Allen Unit 3	113	266	
Bull Run Unit 1	760	1,608	14
Colbert Unit 5	2,697	10,739	60
Cumberland Unit 1	452		-[99]
Cumberland Unit 2	277		4
John Sevier Unit 3	35	98	
Kingston Unit 6	228	782	
Kingston Unit 8	318	737	4
Paradise Unit 1	883		
Paradise Unit 2	2,359		
Paradise Unit 3	2,323		
Shawnee Unit 1	148	177	
Shawnee Unit 4	263	309	
Widows Creek Unit 5	37	51	2

EPA Enforcement Exs. 175-88. Mr. Van Gieson testified that these retrospective predictions of emissions increases "recreate emissions calculations that would have been prepared by TVA at the time of the modification with information that was available at that time." EPA Enforcement Ex. 277 at 3 (Van Gieson pre-filed testimony). EPA Enforcement argues further that "TVA's own internal documents

[99]Mr. Van Gieson's calculations showed a decrease in emissions for this pollutant at this unit.

generated at the time of each physical change prove that the physical change was intended to increase operations and, consequently, would result in an emissions increase." EPA Enforcement Post-Hearing Reply Brief at 27-28.

EPA Enforcement's requests for findings of violation (*see supra* Part III.A, Chart No. 1) were initially based upon its arguments that the actual-to-potential test is the appropriate method for determining whether a permit was required for the changes. Because we have held for the reasons stated in Part III.D.5.b above that EPA Enforcement may not rely upon the actual-to-potential test in this case, EPA Enforcement's evidence does not support its requests in several respects. In particular, Mr. Van Gieson's calculations for his actual-to-projected-actual method, with the high-two-of-five baseline, do not show that the significance level[100] (of 40 tpy for SO_2 and NO_X, and 25 tpy for PM) would be exceeded for the following units and pollutants: (1) Bull Run Unit 1 for PM; (2) Cumberland Unit 1 for PM; (3) Cumberland Unit 2 for PM; (4) John Sevier Unit 3 for NO_X; (5) Kingston Unit 8 for PM; and (6) Widows Creek Unit 5 for both NO_X and PM. Accordingly, before turning to any of TVA's objections and challenges to Mr. Van Gieson's testimony, we hold that EPA Enforcement has failed to prove that TVA was required to obtain a PSD or nonattainment NSR permit for these pollutants at these units.

TVA raises two primary arguments to discredit Mr. Van Gieson's testimony. First, TVA argues that Mr. Van Gieson's own testimony as to his calculation under another methodology based upon the post-change operating data (which shows decreased emissions in some instances) demonstrates that Mr. Van Gieson must have used erroneous assumptions in making his projections. TVA Post-Hearing Brief at 67-68. Second, TVA argues that Mr. Van Gieson misused the data contained in the GADS records. *Id.* at 68-70; *see also* TVA Post-Hearing Reply Brief at 49-51. More specifically, TVA states that "GADS data overestimate the impact of outages and forced deratings, offer no insight into future operations of a unit as a whole, and bear no relationship to demand or causation." TVA Post-Hearing Reply Brief

[100] *See* definition of "significant" at 40 C.F.R. § 52.21(b)(23) (1984).

at 53; *see also id.* at 53-55, 57-61. These arguments must be rejected for the following reasons.

For two reasons, we reject TVA's arguments that Mr. Van Gieson's testimony regarding the post-change operating data demonstrates that he must have used erroneous assumptions. By this argument, TVA juxtaposes data regarding post-change operations – in other words, actual-to-confirmed-actual evidence[101] – which in a minority of instances showed reduced pollutant emissions in the first two-years of post-change operations,[102] with Mr. Van Gieson's retrospective predictions to argue that Mr. Van Gieson must have made a mistake. In evaluating TVA's argument, it is first important to note that Mr. Van Gieson's testimony regarding the confirmed-actual evidence only relates to the first two-year period following the changes and, therefore, cannot be looked to as definitive proof that the project did not result in an emissions increase. To the contrary, because we are looking at changes from a baseline of the two-year period with the highest emissions within the previous five years, the fact that an occasional decline in emissions was observed in the confirmed-actual evidence is not remarkable. What is remarkable is the large number of units for which emissions actually increased in the first two-year period immediately following the performance of the change when compared

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[101]Both Mr. Van Gieson and TVA's witness, Mr. Houston, provided an analysis of the available information regarding TVA's post-change operation of the units. These analyses were not "retrospective predictions," but instead were performed similar to the calculation of emissions in the baseline period. We generally refer to this analysis as an actual-to-confirmed-actual test.

[102]Mr. Van Gieson's calculation of the confirmed-actual emissions demonstrated reduced emissions for the pollutants that remain at issue at the following units: Bull Run Unit 1 for NO_X; John Sevier Unit 3 for SO_2; Kingston Units 6 and 8 for NO_X and SO_2; Shawnee Unit 4 for NO_X and SO_2; and Widows Creek Unit 5 for SO_2. As noted in the text, EPA Enforcement introduced many documents showing that TVA undertook these projects with the intention to increase operations after the changes. The confirmed-actual evidence in the record only shows that TVA had not, within the first two years of post-change operations, increased emissions at these plants above the previous high emissions period. Such evidence is not sufficient to rebut the direct evidence of TVA's intention to increase operations, from which TVA reasonably could have predicted emissions increases. However, as discussed below, we hold that the totality of EPA Enforcement's proof as to a predicted emissions increase at one of these units, Widows Creek Unit 5, for SO_2 is not sufficient.

to the previous high pre-change emission period. One would expect that, if the projects did not result in emissions increases, emissions after the physical changes would not generally increase above the amount of emissions during what has been determined to be the previous high pre-change emissions period.

In particular, contrary to TVA's suggestion, Mr. Van Gieson's calculations based upon the first two-year's confirmed-actual data actually confirmed that the following units increased emissions for the following pollutants:[103]

Chart No. 5

	NO_X (tpy)	SO_2 (tpy)	PM (tpy)
Allen Unit 3	1,732	2,391	
Bull Run Unit 1		4,546	
Colbert Unit 5	1,774	7,467	30
Cumberland Unit 1	21,187		
Cumberland Unit 2	4,192		
John Sevier Unit 3	298		
Paradise Unit 1	1,007		
Paradise Unit 2	421		
Paradise Unit 3	10,674		
Shawnee Unit 1	720	673	

EPA Enforcement Exs. 175-88. Thus, Mr. Van Gieson's review of the confirmed-actual data confirms that significant emission increases in fact occurred in many instances in the first two-years of post-change

[103]Increases for pollutants for which EPA Enforcement has not requested a finding of violation are omitted.

operations. Indeed, the confirmed-actual evidence shows that there was a significant NO_X emissions increase at John Sevier Unit 3, where Mr. Van Gieson's retrospective predictions did not show that the applicable significance level of 40 tpy would be exceeded.[104]

Second, as we have held above in Part III.D.5.b, violations of the PSD and nonattainment NSR preconstruction permitting requirements should be based upon evidence as to predictions that a source owner reasonably could have made prior to undertaking the particular physical change. This conclusion, as noted, is based upon the statutory and regulatory requirement that NSR permits be obtained before the effects of the project can be known and, therefore, calculation of an emissions increase must be based upon projections. Such retrospective predictions should generally seek to eliminate (to the extent possible) knowledge obtained solely from hindsight[105] in order to most accurately gauge whether a respondent should have obtained a permit prior to undertaking the particular change. Significantly, had TVA properly complied with the preconstruction permitting requirements and submitted predictions of emissions increases, TVA would not have been allowed to later challenge those predictions on the grounds that confirmed-actual data demonstrated error in the predictions. *Hawaiian Elec. Co. v. EPA*, 723 F.2d 1440, 1446 (9th Cir. 1984) ("Nothing in the Clean Air Act or its legislative history indicates that Congress intended that EPA should have to reconsider each and every PSD permit if modeling predictions were subsequently drawn into question."). TVA should not, by its failure to comply with the Act's requirements, obtain an after-the-fact data review that is not available to other permit applicants.

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[104]EPA Enforcement has not argued in its briefs that, if the retrospective prediction methodology is used, we should nevertheless make a finding of violation based upon the confirmed-actual evidence in this instance.

[105]*See Coleman v. Commissioner*, *53* T.C.M. (CCH) 598 (1987) (in order to determine whether the transaction was properly characterized as a sale, as opposed to a financing agreement, for tax purposes, the Tax Court rejected the testimony of an expert who admitted difficulty in avoiding "hindsight in making retrospective residual value predictions." Instead, the Tax Court accepted the testimony of an expert who based his retrospective prediction testimony on information available in the market at the time of the transaction, and avoided information regarding subsequent changes in the market affecting whether the purported owner actually retained a residual interest in the property.).

Thus, TVA's mere reference to a minority of instances where the confirmed-actual evidence showed a decrease in emissions, rather than an increase as predicted by Mr. Van Gieson's retrospective predictions, does not, by itself, demonstrate that the reduced emissions would have been predicted by TVA prior to making the physical changes at the unit or that Mr. Van Gieson's prediction methodology is generally unreasonable. In this regard, it is notable that no TVA officer or employee testified (and TVA did not argue in its briefs) that TVA in fact predicted (or even could have predicted) the decreases that apparently occurred. *See, e.g,*, EPA Enforcement Exs. 12, 48, 69, 75, 81, 89, 93 (TVA documents stating that no environmental analysis would be performed).

We do not hold that confirmed-actual emissions data for the post-change period can never be used to determine whether a violation of the permitting requirements occurred. Instead, we simply hold that such evidence is not the best evidence of a violation of a requirement that, if properly complied with, required the respondent to make a reasonable prediction prior to undertaking the particular change. The confirmed-actual data may be looked to as indicating, for example, whether the prediction methodology was generally reasonable. Here, as noted above, the confirmed-actual data demonstrates that a significant number of emissions increases were, in fact, observed in the first two years of post-change operations. This observed increase generally demonstrates that Mr. Van Gieson's retrospective predictions were reasonable.

We also reject TVA's argument that Mr. Van Gieson misused the data contained in the GADS records and that this alleged misuse warrants rejection of Mr. Van Gieson's conclusions. As noted above, TVA argues that "GADS data overestimate the impact of outages and forced deratings, offer no insight into future operations of a unit as a whole, and bear no relationship to demand or causation." TVA Post-Hearing Reply Brief at 53; *see also id.* at 53-55, 57-61. More specifically, TVA contends that the GADS records show when, and to what extent, a unit is "not available" to produce electricity, not the extent to which actual utilization of the unit is reduced as a result of the "derating." TVA Post-Hearing Brief at 69. Based on this contention, TVA suggests that, when a unit is operated before a "derating" at less than maximum capacity, it is logically possible for the unit to experience

a "derating" (i.e., a reduction in maximum available capacity) that does not require TVA to curtail the use of the unit. *Id.* at 69-70 (discussing a hypothetical example presented to TVA's witness). TVA thus contends that the GADS "derating" data "is *independent* of the demand on the unit during that period" and that "[o]ne must also know, at a minimum, whether the unit was called upon to run before and after the project at a level that would have caused the forced temporary derating to have some significance for the unit's actual utilization." *Id.* TVA asserts further that:

> The starting point for any emission projection must be the expected *demand* for the unit, because it is demand that dictates at what level and for how long a unit would be operated during the relevant post-project period. * * * Mr. Van Gieson did not in any way consider actual post-project demand in his "projections," let alone estimate the level of demand that TVA would have projected based on then available information.

TVA Post-Hearing Brief at 71.

There are two principal errors in this argument. First, this argument does not support TVA's conclusion that Mr. Van Gieson's predictions must be rejected. TVA's argument only applies with respect to the "derating" data reported in GADS; TVA does not suggest that the GADS "forced outage" data fails to reflect reduced utilization. As discussed below, "forced outages" are defined by GADS as unplanned interruptions in actual service. Accordingly, the "forced outage" data reflects an impact on actual utilization, not just on available capacity.

Second, contrary to TVA's suggestion, EPA Enforcement did in fact begin by considering TVA's actual intent to utilize the units more after the projects than it was able to use them before the projects. Specifically, Mr. Van Gieson testified that "[f]or calculations done to project the effect of the modifications on emissions of the unit, I relied on both *TVA estimates of the effect of the modification* and on information from [GADS] * * *." EPA Enforcement Ex. 277, at 4 (Van Gieson pre-filed testimony) (emphasis added). The italicized part of this quotation demonstrates that, as part of his analysis, Mr. Van Gieson referred to TVA's own pre-project statements regarding the expected

effect of the projects on post-change utilization. Here, Mr. Van Gieson was referring to the cost-benefit analysis TVA made before each project was approved for Allen Unit 3, Cumberland Unit 1,[106] and Colbert Unit 5. *Id.* at 37, 41, 45. The specific TVA documents relied upon by Mr. Van Gieson are EPA Enforcement Exs. 22, 63, and 93,[107] which contain specific statements by TVA quantifying the extent to which TVA anticipated increased utilization of the particular units. In addition to Mr. Van Gieson's reference in his analysis to three TVA documents, EPA Enforcement identified many other TVA documents reflecting TVA's intent to increase utilization of its units after completing the projects at issue in this case.

An example of TVA's pre-project estimates, which were relied upon by Mr. Van Gieson, is the "Project Authorization" memorandum for the changes made to Colbert Unit 5, which bears a stamp indicating approval by the TVA Board of Directors in August 1979. EPA Enforcement Ex. 22. In that document, TVA stated that "[t]he proposed work is *intended* to *restore* the unit capability, *reduce* the total outage rate approximately 33 percent," among other things. *Id.* (emphasis added). TVA noted that "[w]hen the unit *was* operated it *was* derated 100 MW * * *," and that "at least another $50 million capital cost for new capacity can be saved as a result of the *restored* 100-MW capacity."

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[106]TVA also raises additional arguments specific to Mr. Van Gieson's testimony regarding Cumberland Unit 1. TVA Post-Hearing Reply Brief at 52-53.

[107]In TVA's Post-Hearing Brief, TVA argues that Mr. Van Gieson's reliance on EPA Enforcement Ex. 93 as showing a 7 MW derating at Cumberland Unit 1 constitutes error. TVA notes that in that exhibit, which is a copy of a TVA document prepared in 1991, TVA merely predicted a future 7 MW derating. TVA argues that Mr. Van Gieson erred by assuming that the derating actually occurred. TVA states that TVA Ex. 9, att. 14 (GADS data) demonstrates that the 7 MW derating was never realized. The exhibit and attachment to which TVA refers consists of 26 computer discs containing compressed data. TVA has not identified where on those discs we may find the proof to which it refers – it is not our responsibility to search such voluminous information in the absence of some further direction by TVA. However, we conclude that Mr. Van Gieson's calculations based on a 7 MW derating are merely cumulative, as his predicted emissions increase without the increase attributable to the 7 MW derating greatly exceeds the 40 tpy significance level for NO_X. Without the 7 MW derating, Mr. Van Gieson's retrospective prediction calculation showed a 216 tpy NO_X emissions increase. EPA Enforcement Ex. 178. It bears noting that the confirmed-actual evidence showed that NO_X emissions increased by 21,187 tpy. *Id.*

Id. (emphasis added). These statements are direct evidence that, prior to the physical changes at Colbert Unit 5, TVA intended to increase use of that unit after completing the physical changes. While there is no need to corroborate such direct evidence of TVA's pre-change intention, it is nevertheless worth noting that TVA's witness, Mr. Houston, admitted that, for five years prior to the changes at Colbert Unit 5, TVA never operated that unit at higher than 400 MW per hour, and that, during every month during the year after the changes, TVA operated Colbert Unit 5 at 500 MW per hour or higher. Tr. 978-81.

Many other documents introduced into evidence by EPA Enforcement show TVA's expectation that the physical changes would "eliminate forced outages," EPA Enforcement Ex. 57 (Allen Unit 3), or "improve the availability and forced outage rate." EPA Enforcement Ex. 3 (Paradise Unit 1); *see also* EPA Enforcement Exs. 7 (Paradise Unit 2), 19 (Colbert Unit 5), 11 (Paradise Unit 3), 72 (Bull Run), 102 (Cumberland Unit 2). Other documents include references like the following:

- "excessive boiler tube failure," "improve reliability." EPA Enforcement Exs. 2 (Paradise Unit 1), 9 (Paradise Unit 3), 73 (Bull Run).

- "[t]his cracking has caused an increase in header nipple tube failures and thus a decrease in unit availability." EPA Enforcement Ex. 81 (Cumberland Unit 1).

- "Paradise Unit 1 has reached forced outage levels exceeding 20 percent. Boiler tube leaks in the furnace and cyclones have accounted for 96 percent of all forced outages." EPA Enforcement Ex. 4; *see also* EPA Enforcement Exs. 10 (Paradise Unit 3), 17 (Paradise Units 1, 2, & 3).

- "Based on samples taken, the existing tubes are failing because of creep damage experienced while operating at high-temperatures. This indicates that these tubes have reached the end

of their life." EPA Enforcement Ex. 46 (Widows Creek Unit 5); *see also* EPA Enforcement Ex. 48 (Widows Creek Unit 5).

- "The secondary superheater has been the number 3 contributor to forced outages at Cumberland in the past 5 years." EPA Enforcement Ex. 87 at 8914159; *see also* EPA Enforcement Ex. 88 ("has resulted" in damage causing loss of generation).

- "Stub tube wall failures on the secondary superheater outlet headers are contributing 18 ½ of the boiler forced outage hours for [Cumberland] unit 2." EPA Enforcement Ex. 101 at 8914497.

- For Cumberland Units 1 and 2, "lost generation is averaging over 350,000 MW-hr per year from emergency forced outages for repair of tube leaks in the secondary superheater." EPA Enforcement Ex. 111 at 8935347.

- "Over the last four years there has been experienced an average of fourteen four-day outages to repair the tube leaks in the lower waterwall tubes." EPA Enforcement Ex. 122 (Kingston Unit 6).

These examples of TVA's own statements made in project justification documents prior to the physical changes to the units at issue in this case demonstrate that, by the physical changes, TVA expected to eliminate significant forced outages and other negative effects on actual unit utilization. Thus, based on TVA's own pre-project statements, EPA Enforcement established a reasonable inference that TVA in fact held a pre-project intention to operate all of these units more after the physical changes than it was able to operate them before the changes. In short, we believe that statements such as "eliminate forced outages" indicate an intention to operate a unit more after the physical changes than was possible prior to the change.

This reasonable inference regarding TVA's pre-project intention is confirmed and substantiated by the fact that TVA did, in fact, increase utilization of a majority of the units within the first two years immediately following the physical changes. The confirmed-actual data in this case, which we have held may be looked to as generally demonstrating the reasonableness, or unreasonableness, of a prediction methodology, is also relevant in assessing the reasonableness of a retrospective prediction of emissions increase in another respect. The confirmed-actual data showing increased operations, and hence increased emissions, is relevant information regarding the source operator's state of mind or, more specifically, its intention to increase operations after making the physical changes. *See, e.g., United States v. Louisiana-Pacific Corp.*, 682 F.Supp. 1141, 1161-63 (D. Colo. 1988) (holding, for the purposes of determining whether a source violated the PSD preconstruction permitting requirements, that evidence of a source owner's knowing and routine violation of maximum operation restrictions contained in a state operating permit is grounds for disregarding the permit's restrictions when calculating the source's emissions for PSD applicability). Here, EPA Enforcement introduced evidence that both directly and by reasonable inference shows that TVA intended to increase operations of the fourteen units after it completed the physical changes at those units. Mr. Van Gieson's testimony that TVA in fact increased operations and pollutant emissions after the physical changes at many of these units is evidence that corroborates the inference that TVA intended to increase operations and, therefore, should have predicted increased emissions.[108]

The reasonable inference regarding TVA's pre-project intention to increase use of these plants after the physical changes is further substantiated by TVA's own expert witness, who testified, in justifying a high-two-of-five baseline, regarding TVA's intent to "operate[] its boiler units to achieve a full load limit based on design flow." TVA Ex. 9, at 4 (Houston pre-filed testimony). It naturally follows from such an intent that, when the physical changes corrected pipe deterioration that

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[108]We do not need to decide in this case whether post-change emissions data, standing alone, is sufficient to establish an inference regarding the source operator's pre-change state of mind. As discussed below, EPA Enforcement introduced other evidence from which a reasonable inference of such intention could be drawn. Thus, here, the post-change data merely corroborates this inference.

had caused forced outages or prevented operation at full design capacity, TVA intended to increase utilization after the physical changes were made. Thus, we conclude that, before it made the physical changes at issue in this case, TVA intended to increase utilization of the units after the changes, and it should have thus predicted increased emissions from those changes.

We need not determine whether TVA used each unit in the pre-change period to the unit's maximum available capacity. Notwithstanding any lack of absolute physical limitation on increased use of a unit prior to the changes to that unit, TVA's statements of intention, as a justification of the costs of the project, demonstrate TVA's own conclusion that the project would remove a physical constraint on the unit's utilization. Given that the projects were intended to remove these limitations, it is reasonable to conclude that emissions increases resulting from the project should have been predicted by TVA. Moreover, the evidence demonstrates that, in general, changes in annual system-wide demand did not affect the utilization of the coal-fired units. *See* TVA Ex.12, att. 7. Instead, increased utilization of the coal-fired units in the early to mid-1980s was correlated with TVA's decision to decrease use of its nuclear units; demand-related deployment of the coal-fired units remained relatively constant from 1986 through 1992 (when most of these projects were performed) because, in general, increases in demand after 1985 were accommodated by increased use of TVA's nuclear units. Tr. at 469, lines 6-7; 1059, lines 8-25; 1060, lines 105; TVA Ex. 12, att. 7. Thus, a preponderance of the evidence in the record of this case demonstrates that it was predictable that emissions would increase above the applicable significance levels as a result of the physical changes at issue, and that such increases were not attributable to changes in aggregate demand on TVA's system.

Where Mr. Van Gieson was able to identify a TVA statement that quantified the anticipated increased post-change utilization, Mr. Van Gieson used TVA's own quantification. EPA Enforcement Ex. 277 at 37, 41, 45 (Van Gieson pre-filed testimony). However, where there were only generalized statements from TVA of its intent to increase utilization, Mr. Van Gieson turned to the GADS records to quantify the increased utilization associated with the specific boiler components that were being repaired or replaced in each project. Those records include data regarding lost megawatt hours during "forced outages," which are

defined by GADS as an outage caused by an event that "requires immediate removal of a unit from service" or delayed removal from service, but which is a type of outage that "can only occur while the unit is in service." TVA Ex. 11, at p. III-6 to -7 (GADS Data Reporting Instructions). Based on the nature of the GADS information, we conclude that it was reasonable for Mr. Van Gieson to turn to the GADS records as providing a means for quantifying the amount of emissions increase resulting from TVA's intended increased utilization of the units after completion of the physical changes. Mr. Van Gieson's use of this data was appropriately focused narrowly on the "lost" megawatt hours associated with the specific components that were replaced as part of the physical changes. Moreover, this approach satisfies the *WEPCO* court's concern that post-change emissions projections should take into account the prior operating history of the unit. *WEPCO*, 893 F.2d at 918. Here, the prior operating history is accounted for by the selective use of only the deratings and forced outages associated with the components being replaced.

To the extent that TVA argues that the GADS records do not show whether the unit will be operated more or less after the physical change, *see* TVA Post-Hearing Reply Brief at 53, this argument is addressed and rejected by our conclusion, based on other evidence, that TVA in fact intended to increase utilization after the physical changes. To the extent that TVA is arguing that the GADS data do not necessarily show any forced utilization reduction in the pre-change period, this argument cannot stand in the face of the GADS reporting instructions applicable to "forced outages," which specifically state that such outages are an interruption in service – in other words, an interruption in actual utilization and, therefore, necessarily a pre-change reduced utilization.

Finally, to the extent that TVA argues that the GADS data may still overestimate the amount of any increased emissions, it is worth noting the extent to which Mr. Van Gieson's projections predicted that the applicable significance threshold would be exceeded. In particular, with only one exception (Widows Creek Unit 5, discussed below), the predicted exceedences were more than two times, and up to more than fifty-eight times, the applicable 40 tpy significance level for NO_X and

SO_2.[109] Without further proof, we are unprepared to accept a margin of error of 100% or more in the GADS data.

Under these circumstances, where we have already found that TVA intended to increase utilization and justified these projects by reference to eliminating already existing forced outages, we conclude that EPA Enforcement has shown, by a preponderance of the evidence, that the projects at the following units would result in "significant net emissions increases" of the identified pollutants. TVA has not suggested that more accurate information was available to it from which it could have more accurately projected the amount of increased utilization that it intended. The units and pollutants for which we find that EPA Enforcement has shown a physical change that would result in a significant net emissions increase are as follows (an "X" indicates a finding of violation):

Chart No. 6

	NO_X	**SO_2**	**PM**
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	
Colbert Unit 5	X	*[110]	X

[109]This means that for all but one unit, TVA would have predicted an exceedence of the 40 tpy NO_X and SO_2 significance level if it intended to increase utilization by as little as one-half of the previous forced shutdown and deratings associated with the components being repaired or replaced. Two units, Allen Unit 3 for NO_X and John Sevier Unit 3 for SO_2, were more than twice, but less than three times the 40 tpy significance level. In addition, Shawnee Unit 1 for NO_X was more than three times, but less than four times the 40 tpy significance level. All other units and pollutants were predicted to exceed the significance level by more than four times. Indeed, in the more extreme case, TVA would have known that if it increased utilization by any more than 1/58th of the previous forced shutdowns and deratings, the significance level would be exceeded.

[110]As noted above, the alleged violation of the permitting requirements with respect to SO_2 at Colbert Unit 5 will be discussed below in Part III.E.

	NO_X	SO_2	PM
Cumberland Unit 1	X		
Cumberland Unit 2	X		
John Sevier Unit 3		X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	
Paradise Unit 1	X		
Paradise Unit 2	X		
Paradise Unit 3	X		
Shawnee Unit 1	X	X	
Shawnee Unit 4	X	X	

With respect to Widows Creek Unit 5 for SO_2, for which the projected emissions increase was 51 tpy, or only 11 tpy over the 40 tpy significance level, we hold that, on balance, the evidence is not sufficient to conclude by a preponderance of the evidence that TVA should have anticipated that an exceedence of the significance level would occur. We make this judgment by considering both Mr. Van Gieson's testimony regarding his projected emissions increase of 51 tpy, and Mr. Houston's testimony suggesting that Mr. Van Gieson's reliance on GADS derating information and the full amount of the associated MWH loss may overestimate the expected emissions increase to some degree. As discussed above, we have generally concluded that Mr. Van Gieson's predictions of emissions increases that more than double the 40 tpy significance level are sufficient to establish that TVA should have predicted an exceedence of the significance level for such pollutants. Nonetheless, because Mr. Van Gieson relied principally on the GADS data in arriving at his projection for Widows Creek Unit 5 and the record suggests that there may be some margin of error in the estimates based on GADS data, we conclude that the predicted increase for SO_2 at Widows Creek Unit 5 is not sufficient proof that TVA should have

anticipated that the significance level would be exceeded. Therefore, on the record before us, we find no violation of the PSD and nonattainment NSR permitting requirements with respect to Widows Creek Unit 5.

For the foregoing reasons, we find that EPA Enforcement has sustained its burden of proof that twenty pollutants at eight of TVA's coal-fired plants would have increased as a result of physical changes made to thirteen of the units at those plants. In addition, as discussed below in Part III.E we find that the physical changes to Colbert Unit 5 resulted in an emissions increase of SO_2 under the Alabama nonattainment NSR program in effect prior to 1983. Accordingly, we find a total of twenty-one violations of the PSD and nonattainment NSR permitting requirements.

E. *NSPS and Alabama Pre-1983 Nonattainment NSR Emissions Increase Requirements*

The Compliance Order alleges that the changes made to Paradise Unit 3 in 1984 and the changes made to Colbert Unit 5 in 1982 violated the NSPS requirements. In its post-hearing brief, EPA Enforcement states that it has decided not to pursue its claim that the changes made to Paradise Unit 3 violated the NSPS requirements. EPA Enforcement Post-Hearing Brief at 163 n.102. With respect to Colbert Unit 5, however, EPA Enforcement states:

> TVA's rehabilitation project so significantly changed the boiler so that the maximum achievable hourly emission rate increased after the project, triggering the modification provision of the NSPS and making Colbert Unit 5 an "affected unit" subject to 40 C.F.R. 60, Subpart Da.

Id. at 163. TVA objects, arguing that the work performed at Colbert Unit 5 did not make it subject to NSPS. For the following reasons, we hold that the changes made by TVA to Colbert Unit 5 were "physical changes" that increased the unit's maximum hourly emissions rate and that, therefore, Colbert Unit 5 became subject to the NSPS for electric steam generating boilers as a result of such changes.

In this part of our analysis we also discuss the allegations that the changes to Colbert Unit 5 resulted in an emissions increase under the applicable provisions of the Alabama SIP's pre-1983 nonattainment NSR permitting requirements, which were in effect at the time of the project at Colbert Unit 5.

The NSPS regulations are applicable to the owner or operator of any electric utility steam generating unit, "the construction or *modification* of which is commenced after the date of publication * * * of any standard * * * applicable to that facility." 40 C.F.R. § 60.1(a) (1982) (emphasis added). EPA has published standards applicable to electric utility steam generating units for which construction or modification is commenced after September 18, 1978. 44 Fed. Reg. 33,613 (1979) (codified at 40 C.F.R. pt. 60, subpt. Da §§ 60.40a-49a) (*see* Regulation Stipulation tab 23). These NSPS cover PM, NO_X and SO_2.

For the purposes of part 60, the term "modification" is defined as follows:

> *Modification* means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility * * *.

40 C.F.R. § 60.2 (1982). Further,

> Except as provided under paragraphs (e) and (f) of this section, any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act.

Id. § 60.14(a). Emissions rate is expressed as "kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable." *Id.* § 60.14(b). Briefly stated, these provisions require that, for purposes of determining the applicability of the NSPS requirements, an emissions

increase is calculated based upon the potential hourly emissions of the unit, not its actual emissions. A substantially similar test was required by the Alabama SIP provisions governing nonattainment NSR prior to their amendment in 1983. *See* Regulation Stipulation tab 16, § 16.3.2(b)(4) (referring to increases in "the potential emission rate").[111] The only difference in the pre-1983 Alabama SIP provisions is that the maximum hourly rate is used to calculate a maximum potential annual emissions rate, which must increase by 100 tons or more. *Id.*

The changes at issue in the present case made to Colbert Unit 5 were commenced in 1982, after publication of the NSPS applicable to electric utility steam generating units. Accordingly, TVA was required to comply with the NSPS for the changes at Colbert Unit 5 if those changes constituted "modifications" within the meaning of the applicable NSPS regulations.

The initial question is whether the changes made by TVA to Colbert Unit 5 fall within the scope of "routine, maintenance, repair, and replacement which the Administrator determines to be routine for a source category * * *," which is an exception to the NSPS regulations governing modifications. 40 C.F.R. § 60.14(e)(1) (1984). TVA argues that the project at Colbert Unit 5 falls within this exception. TVA argues that this exception is functionally identical to the exception for routine maintenance, repair and replacement under the PSD and nonattainment NSR programs. Specifically, TVA relies, as support for its claims with respect to NSPS, on the same evidence and arguments that we discussed above in Part III.C of this decision regarding the NSR programs. *See* TVA's Reply Brief at 61. In addition, TVA asserts that "[t]he differences between the NSPS and NSR routine maintenance, repair and replacement language is a distinction without a difference." *Id.*

In contrast, EPA Enforcement argues that the NSPS routine maintenance exception requires an affirmative determination by the Administrator that the activity falls within the exception. EPA Enforcement is correct. The regulatory text, on its face, states that the determination must be made by the Administrator: "routine maintenance, repair and replacement which the *Administrator* determines to be routine

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[111]The Alabama SIP provisions define "potential" as the "maximum capacity to emit."

for a source category * * *." 40 C.F.R. § 60.14(e)(1) (1984). In addition, we note that this exception is different from the exception under the NSR regulations in that the NSPS version makes reference to "routine for the source category," whereas no similar reference appears in the NSR regulations. *Compare id. with* 40 C.F.R. § 52.21(b)(2)(ii). Because TVA has not shown that the Administrator has determined, on a source category basis, that changes of the kind undertaken at Colbert Unit 5 are routine maintenance, repair and replacement, TVA cannot avail itself of this exception to the NSPS.[112]

Next, we turn to the question of whether the physical changes made to Colbert Unit 5 resulted in an emissions increase within the meaning of the NSPS regulations and the pre-1983 nonattainment NSR provisions of the Alabama SIP.

EPA Enforcement argues that TVA's thirteen-month extended outage at Colbert Unit 5, which began in 1982 and continued into 1983, was "intended to restore approximately 100 MW of lost capacity." EPA Enforcement Post-Hearing Brief at 165. EPA Enforcement argues that it has demonstrated, through the testimony of Mr. Van Gieson, that the maximum achievable hourly emissions rate at Colbert Unit 5 increased as a result of the physical changes made to that unit. *Id.* at 165-66. EPA Enforcement also argues that this change increased Colbert Unit 5's potential emissions by more than 100 tons per year. *Id.* at 77.

Mr. Van Gieson's conclusion is based upon a substantial increase in the maximum hourly generation rate reported by TVA in its monthly and annual operating reports. Specifically, Mr. Van Gieson reviewed TVA's Monthly Operating Statistics Report for the one-year

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[112]We note as well that the facts of this case do not suggest a basis for reaching a different conclusion under the NSPS regulations from the one we reached under the NSR programs as discussed above. In our earlier discussion in Part III.C, we concluded that the changes made to the Colbert Unit 5 do not constitute routine maintenance, repair and replacement under the NSR routine exception. There, we applied the Agency's four factor test to the project and found that the magnitude of the renovation and the length of time to plan and to implement TVA's work at Unit 5 to be significant facts that cut against considering this construction work to be "routine." Moreover, the rehabilitation of this unit was designed to fundamentally change the manner in which the unit operated. These facts, as well as others more fully discussed in Part III.C.4, in our view establish that the project was not "routine" in either of the two regulatory contexts.

period before the project and noted that TVA never operated Colbert Unit 5 during that period at an hourly generation rate of more than 387 MW.[113] TVA's witness, Mr. Houston, confirmed that, for five years prior to the project, Colbert Unit 5 was not operated at more than 404 MW per hour. Tr. at 980-83.[114] Mr. Van Gieson also noted (which was confirmed by Mr. Houston) that during the one-year period immediately after the project, TVA operated Colbert Unit 5 to achieve a 509-MW maximum hourly net generation rate. *See* Tr. at 983-84.[115] Mr. Van Gieson also used other data reported by TVA in its Monthly Operating Statistics Reports to determine an emissions factor measured in units of emissions per megawatt hour of net generation. EPA Enforcement Ex. 277, at 42-43; EPA Enforcement Ex. 174. By combining this emissions factor with the maximum hourly net generation rates for the pre-change and post-change periods, Mr. Van Gieson determined that the physical changes made to Colbert Unit 5 resulted in an increase in the unit's maximum hourly emissions rate for NO_X, SO_2 and PM. EPA Enforcement Ex. 277, at 43. The emissions rate increase calculated by Mr. Van Gieson was an increase for each pollutant of approximately 25% as a result of the physical changes made to Colbert Unit 5.

TVA argues that Mr. Van Gieson's calculation of the emissions rate increase at Colbert Unit 5 is erroneous or inadequate for two reasons, both related to Mr. Van Gieson's reliance on the "maximum hourly net generation" of the unit. First, TVA argues that the information used by Mr. Van Gieson was the maximum hourly generation rate "actually achieved," rather than the "maximum achievable" rate. TVA Post-Hearing Brief at 49. TVA argues that it presented evidence that the "nominal" derating of the unit to 400 MW

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[113]TVA's monthly operating reports record the maximum hourly net generation during the reporting month.

[114]Mr. Houston's testimony showed that Colbert Unit 5 achieved a maximum hourly net generation rate in October 1977 to September 1978 of 404 MW, for the same period in 1978-79 of 399 MW, in 1979-80 of 397 MW, in 1980-81 of 389 MW, and in 1981-82 of 364 MW.

[115]Mr. Houston's testimony showed that Colbert Unit 5 achieved a maximum hourly net generation rate in October 1982 to September 1983 of 509 MW, and in the same period of 1983-84 of 495 MW. Tr. at 983-84.

prior to the project did not reflect a physical limitation on the maximum generation rate, "but rather reflected, at least in part, an administrative decision by TVA to operate Colbert Unit 5 at a lower generation rate than the unit was capable of in order to improve the long-term reliability of the unit." *Id.* at 50. TVA cites the NSPS analysis in the *WEPCO* case as an example demonstrating that actual achieved rates may be lower than maximum achievable rates. *Id.* Second, TVA argues that "EPA Enforcement ignored in its calculations the fact that *emission* rates are not always directly proportional to the *electric generation* rates that a unit produces." *Id.* (emphasis by TVA). TVA argues that it presented evidence that "the efficiency of the turbine [at Colbert Unit 5] was significantly lower before the project than it was after the project." *Id.* TVA argues that because efficiency was improved, it is not possible to reasonably conclude that the increased actual generation rate after the project translates to an increased emissions rate. *Id.* at 50-51. Both of these arguments must be rejected for the following reasons.

First, we reject TVA's argument that an alleged improvement in turbine efficiency may explain the increased electrical generation. TVA did not provide any evidence that turbine efficiency problems were fully responsible for the reduced generation during the five-year period prior to the project. To the contrary, TVA's witness only stated that "[t]hese problems may or may not account for the full electrical capability reduction of the unit." TVA Ex. 9, at 14 (Houston pre-filed testimony). This inconclusive statement is not sufficient to rebut other evidence in the record showing that the derating prior to the change was caused, at least in part, by problems with the boiler and which were unrelated to the turbine. Specifically, the GADS data listed problems with the boiler steam chest, not any aspect of the turbine, as the reason for the derating in the period of July 1980 through February 1982. *Id.* at 13.

Second, we also reject TVA's argument that we should not look to the actual achieved rate of electrical generation as showing the maximum achievable rate in this case. The *WEPCO* case cited by TVA is instructive on this issue. In that case, WEPCO had five units that it was proposing to renovate, and EPA initially looked to the pre-project actual achieved generation rate and the projected post-project restored generation rate (similar to the evidence submitted by EPA Enforcement in the present case) to conclude that the maximum hourly emissions rate would increase as a result of the project. *WEPCO*, 893 F.2d at 913.

Before WEPCO sought judicial review of this determination, WEPCO requested reconsideration by the EPA on essentially the same grounds raised by TVA in this case, that the achieved rate only reflects an administrative decision and did not reflect the achievable emission rate. *Id.* On reconsideration, EPA allowed WEPCO to conduct five ten-hour tests at each unit to determine the units' maximum capacity, as a means of supplementing the information regarding actual operating history. *Id.* Based on those tests, EPA agreed that two of the units could be operated at their design capacity. However, it concluded that three of the units could not be operated at design capacity and, therefore, the restoration project would increase their achievable capacity by restoring them to their original design capacity. *Id.* at 914-16 & n.9.

WEPCO then objected to this supplemental determination and requested review by the Seventh Circuit. In seeking review, WEPCO raised two arguments, the first of which was that the pre-project historical operating data "reflect voluntary decisions by WEPCO regarding safety considerations * * * and an electricity demand which did not require operation of the units at higher capacities." *Id.* at 914. The Seventh Circuit rejected this argument, saying, "WEPCO's first assertion is easily dismissed. The EPA's choice of the 1987 figures was based entirely upon WEPCO's own data" and the subsequent tests resulted in a revision for only two units. *Id.* This discussion and the Seventh Circuit's conclusions demonstrate an important principle that we apply to the present case: operating data showing the achieved maximum generation rate may be relied upon as evidence of the maximum achievable rate in the absence of tests demonstrating a higher achievable rate. It is also worth noting that later in the decision, the Seventh Circuit stated that "EPA cannot reasonably rely on a utility's own unenforceable estimates of its annual emissions." *Id.* at 917.

In the present case, the admitted fact that TVA never operated Colbert Unit 5 at an hourly rate greater than 404 MW during the entire five-year period prior to the project is compelling evidence that Colbert Unit 5 could not achieve an hourly generation rate comparable to the hourly rate of 509 MW achieved in the year immediately after the project. This evidence is further supported by the GADS data showing a continuous derating from December 5, 1975 to February 1982 of 78-120 MW. TVA Ex. 9, at 13 (Houston pre-filed testimony). TVA has not rebutted this evidence with actual test data demonstrating that Colbert

Unit 5 could achieve a higher rate prior to the project. TVA has only offered testimony by Mr. Houston regarding his interviews with maintenance personnel in mid-2000 as to their recollection of the capability of Colbert Unit 5 in the period immediately prior to the project in 1982. We conclude that this hearsay testimony is unreliable[116] and cannot substitute for the rigorous testing under prescribed protocols that is normally required by EPA before it accepts data other than the actual achieved rate. *See WEPCO*, 893 F.2d at 914-15 & nn.7 & 8. Indeed, in the *WEPCO* case (the one from which WEPCO sought court review), EPA Administrator Lee M. Thomas stated that EPA would not accept mere "assertions that higher-than-actual capacity could be achieved on a economically sustainable basis." Letter from Lee M. Thomas to John W. Boston, WEPCO, at 5 (Oct. 14, 1988).

Accordingly, we conclude that a preponderance of the evidence in the record shows that the physical changes to Colbert Unit 5 removed a physical limitation on the operating potential of the unit and restored it to its original design capacity, thereby resulting in an increase in the maximum hourly emissions rate achievable by the unit for NO_X, SO_2 and PM. Therefore, upon completion of the physical changes at Colbert Unit 5, that unit became subject to the operating restrictions of 40 C.F.R. part 60, subpart Da. TVA has stipulated that it "did not conduct performance testing or perform record keeping and reporting" under subpart Da. Accordingly, we find that TVA violated the NSPS with respect to the operation of Colbert Unit 5 after the physical changes at that unit.

In addition, in terms of TVA's compliance with the pre-1983 nonattainment NSR provisions of the Alabama SIP, the increased maximum hourly emissions rate means that the unit's potential SO_2 emissions increased from 78,104 tpy before the project to 97,630 tpy of SO_2 after the project. *See* EPA Enforcement Ex. 281. This increase greatly exceeds the 100 tpy potential emissions increase necessary to trigger the pre-1983 nonattainment NSR provisions of the Alabama SIP.

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[116]When EPA Enforcement cross-examined Mr. Houston regarding his interviews with the TVA maintenance personnel responsible for Colbert Unit 5 during the relevant time period, Mr. Houston could not answer many questions going to relevant dates of events and the basis of the non-testifying declarant's recollections. *See* Tr. at 985-93, 995. While hearsay evidence is commonly admitted in administrative adjudications, we need not rely on such testimony when, as here, it may be unreliable. *See, e.g.*, 40 C.F.R. § 22.22(a) (allowing unreliable evidence to be excluded).

See Regulation Stipulation tab 16, § 16.3.2. Accordingly, we find that TVA violated the CAA by failing to obtain a preconstruction nonattainment NSR permit under the Alabama SIP.

F. *Violations of the State Minor Modification Permit Requirements*

As noted above in our discussion of the statutory background in Part III.B, the States of Tennessee, Kentucky and Alabama, where TVA's nine coal-fired power plants are located, require as part of their SIPs that source owners obtain "minor" NSR permits under certain circumstances. In the present case, EPA Enforcement argues that TVA was required to obtain a minor source permit for the following projects:

> 1. Under the Tennessee SIP for Memphis County, Allen Unit 3. EPA Enforcement Post-Hearing Brief at 74-75 (citing S1200-3-9-.01-(1) (Memphis/Shelby County portion of SIP)).
>
> 2. Under the Tennessee SIP, Bull Run Unit 1, Cumberland Unit 1 and Unit 2, John Sevier Unit 3, and Kingston Unit 6 and Unit 8. *Id.* at 75-76, 78-83 (citing 1200-3-9-.01-(1) (general Tennessee SIP)).
>
> 3. Under the Alabama SIP, Colbert Unit 5 and Widows Creek Unit 5. *Id.* at 77-78, 89-90 (citing Alabama Reg. 16.1.1(a)).

The Compliance Order also alleged that projects at the units located in Kentucky were each required to have a Kentucky "minor" NSR permit. However, as noted in Part III.A of this decision, EPA Enforcement has not made any further argument in its post-hearing briefs that TVA violated the requirements of the Kentucky minor NSR permitting program. Accordingly, such allegations of the Compliance Order appear to have been abandoned and, therefore, are not sustained. Our discussion in this part will focus on the remaining projects and state minor permitting requirements.

TVA argues that the applicable minor NSR permitting regulations under the Alabama and Tennessee SIPs provide an exemption for "routine maintenance, repair and replacement" and that

each of these projects fall within that exemption. In addition, TVA argues that the minor NSR permitting requirements of these SIPs "apply only where there is an increase in potential emissions or in emissions rates, the emission increase test used in the federal NSPS program." TVA Post-Hearing Brief at 120. TVA argues that EPA Enforcement failed to produce "any evidence that the identified projects at TVA's Tennessee and Alabama units resulted in increased emissions rates." *Id.* For the following reasons, these arguments must be rejected.

1. *Tennessee Minor NSR Permitting Requirements*

In the present case, Allen Unit 3 is located within the jurisdiction of the Memphis/Shelby County permitting authority and Bull Run Unit 1, Cumberland Unit 1 and Unit 2, John Sevier Unit 3, and Kingston Unit 6 and Unit 8 are all located within the jurisdiction of the Tennessee state permitting authority. While the regulations applicable to the Memphis/Shelby County area and the regulations applicable to the remainder of Tennessee are different in a number of particular respects, the specific regulations governing the applicability of the minor NSR permitting requirements are identical in both sets of regulations. Accordingly, for simplicity, we will refer to the broader Tennessee SIP requirements as the surrogate for both sets of regulations.

The Tennessee SIP requires source owners to obtain a permit before beginning modification of an air contaminant source. Specifically, the SIP states as follows:

> Except as specifically exempted in Rule 12-3-9-.04, no person shall begin the construction of a new air contaminant source or the modification of an air contaminant source which may result in the discharge of air contaminants without first having applied for and received from the Technical Secretary a construction permit for the construction or modification of such air contaminant source.

Regulation Stipulation tab 1, § 16-77 (S1200-3-9-.01(1)); *id.* tab 3 (1200-3-9-.01(1)). The term "air contaminant source" as used in this regulation is defined as follows:

> *Air Contaminant Source* is any and all sources of emission of air contaminants, whether privately or publicly owned or operated. Without limiting the generality of the foregoing, this term includes all * * * heating and power plants and stations * * *.

Id. tab 1, § 16-46(A); *id.* tab 4 (1200-3-2-.01(b)); *id.* tab 5 (1200-3-2-.01(b)). "Air Contaminant" is "particulate matter, dust, fumes, gas, mist, smoke, or vapor, or any combinations thereof." *Id.* tab 1, § 16-46(A); *id.* tab 4 (1200-3-2-.01(a)); *id.* tab 5 (1200-3-2-.01(a)). The Tennessee minor NSR rules define "modification" as follows:

> Modification is any physical change in or change in the method of operation of any air contaminant source, which increases the amount of any air contaminant (with an applicable emission standard) emitted by such source or which results in the emission of any air contaminant (with an applicable emission standard) not previously emitted * * *.

Id. tab 1, § 16-46(A); *see also id.* tab 4 (1200-3-2-.01(aa)); *id.* tab 5 (1200-3-2-.01(aa)).[117] The regulation also states that physical change shall not include "routine maintenance, repair and replacement." *Id.* tab 1, § 16-46(A); *id.* tab 4 (1200-3-2-.01(aa)); *id.* tab 5 (1200-3-2-.01(aa)).

EPA Enforcement argues that the changes made to Allen Unit 3, Bull Run Unit 1, Cumberland Unit 1 and Unit 2, John Sevier Unit 3, and Kingston Unit 6 and Unit 8, were "physical changes" within the meaning of these regulations which increased the amount of NO_X, SO_2 and PM emitted by the units. EPA Enforcement argues that increases in the amount of emissions must be measured based upon an actual-to-potential test.

As noted above, TVA argues that the changes to these units were not "physical changes" because the changes were routine maintenance, repair and replacement. TVA Response to Initial Brief at 14. TVA

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[117]The definition of "modification" in the general Tennessee SIP contains an immaterial difference in that the two parenthetical statements used in the definition are "(to which an emission standard applies)," rather than as set forth in the text above.

argues that the routine maintenance exception should be applied consistent to the similar exception under the PSD and nonattainment NSR programs. *Id.* Because, as discussed above in Part III.C, we have found that the identical routine maintenance exception under the PSD and nonattainment NSR programs does not apply to any of the changes at issue, we likewise conclude that this exception does not apply to those changes under the Tennessee SIP minor NSR program.

TVA also argues that the emissions increase test under the Tennessee SIP minor NSR program is not the actual-to-potential test suggested by EPA Enforcement, but instead is the maximum potential hourly rate increase applicable under the federal NSPS program. *Id*. at 14-15. TVA argues that the NSPS emissions test should apply because the definition of "modification" under the Tennessee minor NSR permit is identical to the definition of that term under the federal NSPS regulations. *Id*. (citing 40 C.F.R. § 60.2). This argument must be rejected because the federal NSPS emissions increase test (maximum hourly emissions rate) is derived from the regulations at 40 C.F.R. § 60.14, not from the definition of modification at section 60.2. The Tennessee SIP provisions identified in the parties' stipulations do not contain any provision prescribing in detail the method for calculating an emissions increase for a modification similar to that set forth in section 60.14 of the federal NSPS regulations. Accordingly, we find no basis to incorporate that set of regulatory requirements into the definition of "modification" in the Tennessee SIP.

For a similar reason, we also reject EPA Enforcement's arguments that the Tennessee SIP minor NSR modification definition should be read to incorporate the actual-to-potential test. The regulation from which the actual-to-potential test arises, 40 C.F.R. § 52.21(b)(21), has no analogue within the Tennessee minor NSR regulations. Accordingly, we again turn to the actual-to-projected-actual test[118] discussed above in Part III.D.5, and determine that, through Mr. Van Gieson's testimony, EPA Enforcement has sustained its burden of showing that an emissions increase should have been predicted and that TVA was thus required to obtain a minor NSR permit from the

[118]In the absence of another legally prescribed methodology, here, as before, we find this test a reasonable means of measuring emissions increases. *See WEPCO*, 893 F.2d 901.

applicable Tennessee or Memphis/Shelby County permitting authority.

Because the minor NSR regulations do not have a "significance" threshold of 40 tpy for NO_X and SO_2 and 25 tpy for PM, there are more violations of the minor permitting requirements than we found above with respect to PSD and nonattainment NSR. In particular, we find that TVA was required to obtain a Tennessee minor NSR permit for the following pollutants at the indicated units:

	NO_X	**SO_2**	**PM**
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	X
Cumberland Unit 1	X		
Cumberland Unit 2	X		X
John Sevier Unit 3	X	X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	X

TVA stipulated that it did not have a Tennessee minor NSR permit for any of these pollutants and physical changes at these units. Joint Fact Stipulation ¶ 15. Accordingly, TVA violated the Tennessee SIP provisions prohibiting construction without a permit.

2. *Alabama Minor NSR Permitting Requirements*

Colbert Unit 5 and Widows Creek Unit 5 are located within Alabama and, therefore, are potentially subject to the Alabama minor NSR permitting requirements. The Alabama SIP states as follows:

> Permit to Construct. Any person building, erecting, altering, or replacing any article, machine, equipment, or other contrivance, the use of which may cause the issuance of or an increase in the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants, shall

> first obtain authorization for such construction from the Director in the form of a Permit to Construct.

Regulation Stipulation, tab 19, § 16.1.1(a); *see also id.* tab 20, § 16.1.1(a).[119] The term "air contaminant" as used in this regulation is defined as follows:

> "Air Contaminant" shall mean any solid, liquid, or gaseous matter, any odor, or any combination thereof, from whatever source.

Id. tab 21, § 1.2.1. The terms "building, erecting, altering, or replacing" as used in section 16.1.1 are not defined by the Alabama SIP.

EPA Enforcement argues that the changes made to Colbert Unit 5 and Widows Creek Unit 5 fall within the terms "building, erecting, altering, or replacing" and that those changes increased the amount of NO_X, SO_2 and PM emitted by the units. EPA Enforcement argues that increases in the amount of emissions must be measured based upon an actual-to-potential test.

As noted above, TVA argues that the term "alteration" as used in section 16.1.1 is synonymous to "modification," which is defined by the Alabama SIP (that definition is substantially the same as the Tennessee definition of "modification" quoted above). TVA Response to Initial Brief at 16. TVA argues that because the two terms are ordinarily synonymous, we should apply the regulatory definition of "modification" in place of the term "alteration" as used by section 16.1.1. There are two errors in this argument. First, while the terms "alteration" and "modification" may be generally synonymous, it however does not follow that a highly detailed and specific regulatory definition of one term can be substituted for the other. Instead, we conclude that the much broader and more general plain meaning of "alteration" must be used in the absence of anything in the regulations suggesting a narrower regulatory definition. Second, by its suggested contrivance of incorporating the definition of "modification" in place of

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[119]The version of the applicable regulation at tab 20 of the Regulation Stipulation became effective October 28, 1985, and contains immaterial changes from the version quoted in the text above.

"alteration," TVA suggests that "routine * * * replacement" was not intended to be included as a form of alteration. *Id* at 17. Such an interpretation would violate the plain meaning of the regulatory text. Section 16.1.1 specifically includes "replacing" among its list of changes that may require a permit and does not provide for an exception for "routine * * * replacement." We cannot by interpretation create an exception where one does not exist.

TVA also argues that the emissions increase test under the Alabama SIP minor NSR program is not the actual-to-potential test suggested by EPA Enforcement, but instead is the maximum potential hourly rate increase applicable under the federal NSPS program. *Id*. at 17. TVA argues that the NSPS emissions test should apply because the definition of "modification" under the Alabama SIP is substantially the same as the definition of that term under the federal NSPS regulations. *Id.* (citing 40 C.F.R. § 60.2). This argument must be rejected for two reasons. First, as noted above, the Alabama SIP minor NSR permitting requirements are based upon "building, erecting, altering, or replacing," not upon "modification" – the linchpin for NSPS coverage. *See* Regulation Stipulation, tab 19, § 16.1.1(a); *see also id.* tab 20, § 16.1.1(a). Second, the federal NSPS emissions increase test (maximum hourly emissions rate) is derived from the regulations at 40 C.F.R. § 60.14, not the definition of modification at section 60.2. Not only do the Alabama SIP minor NSR provisions fail to mention "modification," but they also do not contain any provision prescribing in detail the method for calculating an emissions increase for a modification similar to that set forth in section 60.14 of the federal NSPS regulations. Accordingly, we find no basis to incorporate the "maximum hourly emissions rate" requirement of the federal NSPS regulation into section 16.1.1 of the Alabama SIP governing when a minor NSR permit must be obtained.

For a similar reason, we also reject EPA Enforcement's arguments that the Alabama SIP minor NSR modification definition should be read to incorporate the actual-to-potential test. The regulation from which the actual-to-potential test arises, 40 C.F.R. § 52.21(b)(21), has no analogue within the Alabama minor NSR regulations. Accordingly, we turn once more to the actual-to-projected-actual test discussed above in Part III.D.5, and determine that, through Mr. Van Gieson's testimony, EPA Enforcement has sustained its burden of

showing that an emissions increased occurred and that TVA was thus required to obtain a minor NSR permit from the applicable Alabama permitting authority.

Because the minor NSR regulations do not have a "significance" threshold of 40 tpy for NO_X and SO_2 and 25 tpy for PM, there are more violations of the minor permitting requirements than we found above with respect to PSD and nonattainment NSR. In particular, we find that TVA was required to obtain an Alabama minor NSR permit for the following pollutants at the indicated units:

	NO_X (tpy)	**SO_2 (tpy)**	**PM (tpy)**
Colbert Unit 5	X	X	X
Widows Creek Unit 5	X	X	X

TVA stipulated that it did not have an Alabama minor NSR permit for any of these pollutants and changes at these units. Joint Fact Stipulation ¶ 15. Accordingly, TVA violated the Alabama SIP provisions prohibiting construction without a permit.

G. *The Appropriate Remedies for TVA's Violations*

The Compliance Order states, in lettered paragraphs from (a) to (i), various actions that TVA must take in order to remedy the violations identified in the Compliance Order. TVA has objected to these remedies, arguing generally that many of them are not authorized by the CAA. In this part, we consider TVA's arguments and EPA Enforcement's responses.

In summary, the Compliance Order directs TVA to undertake the following actions to remedy its violations of the CAA: (1) TVA shall "provide a detailed schedule with appropriate milestones submitted for approval by EPA for achieving compliance with all NSR (both PSD and nonattainment NSR) requirements," which schedule shall identify the pollution control technology to be installed on the plants with nothing less protective than selective catalytic reduction ("SCR") for NO_X emissions control. Compliance Order § IV.1(a); (2) TVA shall provide a schedule for complying with all NSPS requirements, § IV.1(b);

(3) TVA shall enter into a "Federal Facilities Compliance Agreement" regarding such schedules, *id.* § IV.1(c);[120] (4) TVA shall submit to the appropriate federal, state and local authority applications for NSR permits and Title V[121] operating permits for the modifications identified in the order, *id.* § IV.1.(d); (5) TVA shall provide EPA an audit of each of its coal-fired power plants to identify all physical changes made since 1977 that may have triggered the NSR and NSPS requirements, *id.* § IV.1(e); (6) TVA shall prepare a compliance schedule and Federal Facilities Compliance Agreement for all violations identified in the audit. *Id.* § IV.1(f), (g);[122] and (7) finally, TVA must retire and not use certain SO_2 allowances under CAA Title IV. *Id.* § IV.1(h).

TVA raises a number of objections to the remedy sections of the Compliance Order. Briefly, TVA objects to the remedy requests in sections IV.1(a), (b), (d), (f) and (g) with respect to submission of compliance schedules and the means for determining best available control technology ("BACT") with respect to NO_X. TVA also objects to the request that TVA be required to provide an audit as set forth in section IV.1(e) and to the request that it be required to surrender SO_2 allowances in section IV.1(h). These arguments will be discussed below.

1. *Compliance Schedules, Applications, BACT for NO_X and Related Issues*

TVA has raised a number of related arguments regarding the compliance schedule and permit application remedies under sections IV.1(a), (b), (d), (f) and (g). Specifically, TVA argues that EPA Enforcement has no authority to specify that the control technology for NO_X shall be no less protective than SCR. TVA Post-Hearing Brief at 107. Rather, TVA argues that control technology determinations must be made on a case-by-case basis by the appropriate federal, state or local

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[120]TVA has not objected to this requested remedy and, accordingly, it is sustained.

[121]TVA has not objected to this requested remedy (that it be required to submit applications for Title V operating permits) and, accordingly, it is sustained.

[122]TVA has not objected to this requested remedy in so far as it concerns entering into a Federal Facilities Compliance Agreement and, accordingly, it is sustained.

authority. *Id.* at 108. TVA argues further that the compliance schedule and control technology requirements of the Compliance Order impermissibly "foreclose options available to a stationary source under the Clean Air Act and EPA's regulations, including the option to net out of new source review." *Id.*

EPA Enforcement acknowledges that BACT must be determined on a case-by-case basis by the applicable permitting authority.[123] EPA Enforcement states that the Compliance Order simply "sets forth the minimum level of controls [EPA Enforcement] will accept to resolve the case." EPA Enforcement Reply Brief at 65. EPA Enforcement states further as follows:

> [B]y identifying SCR as the minimum acceptable NO_X pollution control device, EPA was merely treating TVA as it would a nongovernmental entity, and not undermining the statutory BACT process. EPA was not, as TVA alleges, attempting to usurp the BACT case-by-case analysis performed by the permitting agency, as set forth in the Act and regulations. Indeed, the [Compliance Order] instructs TVA to submit

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[123]The BACT requirement is defined in the regulations as follows:

> [BACT] means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under [the] Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

40 C.F.R. § 52.21(b)(12); *accord* CAA § 169(3), 42 U.S.C. § 7479(3). As the Board has noted on prior occasions, "[t]he requirements of preventing violations of the NAAQS and the applicable PSD increments, and the required use of BACT to minimize emissions of air pollutants, are the core of the PSD regulations." *In re Encogen Cogeneration Facility*, PSD Appeal Nos. 98-22 to -24, slip op. at 5 (EAB, Mar. 26, 1999), 8 E.A.D. ___; *accord In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. at 11 (EAB, Nov. 25, 1998), 8 E.A.D. ___.

> applications for the appropriate federal, state and local air NSR permits, which applications should include a BACT/LAER analysis, as appropriate.

Id. at 66.[124] Because EPA Enforcement has interpreted the Compliance Order's statements with respect to SCR as BACT for NO_X emissions controls as something to be secured through settlement rather than as a substitute for traditional BACT/LAER analysis, we hold that EPA Enforcement shall be bound by this interpretation. Accordingly, TVA is not bound by EPA Enforcement's assertion, as made in the Compliance Order, that SCR is the minimum pollution control for NO_X.[125]

It further appears that both TVA and EPA Enforcement generally agree that an appropriate remedy for TVA's failure to obtain preconstruction PSD, nonattainment NSR and minor NSR permits is for TVA to be required to apply for such permits. *See* EPA Enforcement Reply Brief at 66 ("the [Compliance Order] instructs TVA to submit applications for the appropriate federal, state and local air NSR permits, which applications should include a BACT/LAER analysis, as appropriate."); TVA Post-Hearing Brief at 118 ("That determination [BACT] must be made by the appropriate state and be based upon a case-by-case, site-specific balancing, of energy, environmental and economic impacts and other costs of the controls available to the units.").[126]

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[124]"BACT/LAER" stands for "Best Available Control Technology/Lowest Achievable Emission Rate." Each of these acronyms refers to technological standards established by different sections of the CAA. BACT is the standard from the PSD provisions of the CAA and LAER is the standard for nonattainment NSR provisions.

[125]However, in the case-by-case BACT determination process conducted by the applicable permitting agency (*see infra* note 127), EPA Enforcement, or any other appropriate part of the Agency, is not precluded from commenting on the BACT analysis or other parts of the permit, including but not limited to SCR being the appropriate minimum pollution control.

[126]TVA does argue that EPA does not have "authority for its order for compliance schedules and permit applications" under CAA § 167, 42 U.S.C. § 7477. TVA Response to Initial Brief at 75. TVA, however, does not argue that such authority is lacking under CAA § 113(a), 42 U.S.C. § 7413(a), which specifically authorizes the Agency to issue administrative orders requiring the respondent to "comply with the

(continued...)

Although TVA appears to concede that requiring it to obtain the necessary NSR permits is generally an appropriate remedy, TVA nevertheless argues that the compliance schedule and control technology requirements of the Compliance Order impermissibly "foreclose options available to a stationary source under the Clean Air Act and EPA's regulations, including the option to net out of new source review." TVA Post-Hearing Brief at 108. TVA thus argues that it may avoid the permitting requirements by electing to reduce emissions elsewhere at the pollution sources – in other words, by making creditable contemporaneous reductions to qualify for "netting" under 40 C.F.R. § 52.21(b)(3)(ii).

This argument must be rejected on the grounds that TVA has failed to show, based on evidence in the record of this proceeding, that it made the required "contemporaneous" emissions reductions (i.e., emissions reductions in the period between five years before the construction commenced and the date when the predicted increases from the physical change would occur). *See, e.g., In re Hawaii Elec. Light Co.*, PSD Appeal Nos. 97-15 to -23, slip op. (EAB, Nov. 25, 1998), 8 E.A.D. ___. Had TVA sought to defend against the Compliance Order's request for relief that TVA must obtain NSR permits based on its claiming contemporaneous emissions reductions, it should have done so in this proceeding. The "netting" option for avoiding the requirement to obtain an NSR permit is provided by the regulatory definition of "net emissions increase." *See, e.g.*, 40 C.F.R. § 52.21(b)(3) (1984). As discussed in Part III.D above, we have found, based upon the record of this case, that the physical changes made by TVA to thirteen of its coal-fired units resulted in significant "net emissions increases" under the applicable regulatory provisions. TVA, therefore, is barred from subsequently attacking this determination by attempting to demonstrate contemporaneous emissions reductions that offset the emissions increases demonstrated on the record of this case. Accordingly, we reject TVA's contention that it may "net out of new source review."

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[126](...continued)
requirements or prohibitions" that the respondent has violated. Since we have found that TVA violated the CAA by failing to obtain preconstruction NSR permits, it is appropriate that TVA be required under section 113 to comply by applying for such permits. Thus, we conclude that section 113(a) provides adequate authority for these portions of the Compliance Order and, therefore, we do not address TVA's assertions regarding the scope of EPA's authority under CAA § 167.

For the foregoing reasons, we sustain the Compliance Order's requirement that TVA apply for, and obtain, PSD, nonattainment NSR and minor NSR permits for the physical changes made to the units and with respect to the pollutants indicated in Parts III.D, III.E and III.F of this decision.[127] Such applications must be filed, and permits obtained, by TVA for the following units and pollutants:[128]

For PSD and nonattainment NSR:

Chart No. 2

	NO_X	**SO_2**	**PM**
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	
Colbert Unit 5	X	X	X
Cumberland Unit 1	X		

[127]TVA's permit applications should be governed by the rules that are in force at the time each application is submitted. Thus, the applications should be submitted to the agency with authority as of the date of the application to issue permits for the particular pollutant in each area. TVA's applications will open a new administrative record before those agencies with respect to the BACT/LAER determinations and the analysis of appropriate pollution controls should take into account all information submitted into the record regarding any factors relevant under the applicable statutory or regulatory requirements, such as technological feasibility and environmental impacts. *See, e.g., In re Pennsauken County, N.J. Resource Recovery Facility,* 2 E.A.D. 667, 670-71 nn.10-12 (Adm'r 1988) (noting that the adequacy of the administrative record is judged as of the close of the record, absent extraordinary circumstances). Thus, we reject TVA's contention that the analysis should look to the circumstances that existed when TVA made the physical changes to its plants. TVA is responsible for the delay in applying for the applicable permits and, therefore, cannot argue that requiring current technology somehow causes it prejudice. That the analysis should not be based on substantially outdated evidence is further confirmed by 40 C.F.R. § 52.21(r)(2), which states that a permit is "invalid if construction is not commenced within 18 months after receipt of such approval, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time."

[128]These summary charts are the ones also set forth in Part III.A of this decision.

	NO_X	SO_2	PM
Cumberland Unit 2	X		
John Sevier Unit 3		X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	
Paradise Unit 1	X		
Paradise Unit 2	X		
Paradise Unit 3	X		
Shawnee Unit 1	X	X	
Shawnee Unit 4	X	X	

For minor NSR under the applicable SIPs:

Chart No. 3

	NO_X	SO_2	PM
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	X
Cumberland Unit 1	X		
Cumberland Unit 2	X		X
John Sevier Unit 3	X	X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	X
Colbert Unit 5	X	X	X

	NO_X	SO_2	PM
Widows Creek Unit 5	X	X	X

2. *Forfeiture of Title IV (Acid Deposition Control) SO_2 Allowances*

TVA objects to the request of Section IV.1(h) of the Compliance Order that TVA surrender certain SO_2 "allowances"[129] allocated to it under Title IV of the CAA. According to EPA Enforcement, the surrender of these allowances is necessary to bring TVA into compliance with the Act and to compensate the environment for TVA's past NSR and PSD violations. EPA Enforcement Initial Brief at 56; EPA Enforcement Post-Hearing Brief at 175. Section IV.1(h) of the Compliance Order states:

> *Sulfur Dioxide Allowances*. For any reductions in sulfur dioxides that result from the addition of pollution control equipment under the federal facility compliance agreement to be entered into pursuant to paragraphs 1(c) and 1(g) above, sulfur dioxide allowances from Title IV of the Clean Air Act equivalent to the reductions must be retired and cannot be used by TVA or sold to any other utility.

TVA objects to this provision on several grounds, including that the Agency lacks the authority under section 113 of the Act to require surrender of its existing SO_2 allowances, and that the provision lacks the specificity required by section 113(a)(4). *See* TVA Response to Initial Brief at 81-89; TVA Reply Brief at 62-66.

Title IV of the CAA, added by the 1990 CAA amendments, is designed to reduce emissions of pollutants contributing to the problem

[129]The term "allowance" is defined as an "authorization, allocated to an affected unit by the Administrator under this subchapter, to emit, during or after a specified calendar year, one ton of sulfur dioxide." CAA § 402(3), 42 U.S.C. § 7651a(3).

of acid deposition (often referred to as "acid rain"). With regard to SO_2 emissions, the Act requires a phased implementation ("Phase I" and "Phase II") of a national cap of 8.95 million tons per year from electric utility plants such as the ones at issue in this matter. The reduction of SO_2 is achieved by giving affected units allowances, which then determines the amount of annual SO_2 the source is authorized to emit. A unit subject to Title IV may not emit SO_2 in excess of the number of allowances held for that unit for that year by the unit's owner or operator. CAA § 403(g), 42 U.S.C. § 7651b(g). The number of allowances allocated to each unit is determined through various formulae utilizing a unit's emissions and fuel consumption.

During Phase I of the program, effective from 1995 through 1999, limits were imposed on the 110 largest sulfur-emitting electric utility plants in twenty-one eastern and midwestern states. CAA § 404(a), 42 U.S.C. 7651c(a). The basic SO_2 allocation formula for Phase I involved multiplying an emissions rate of 2.5 pounds of SO_2 per million British Thermal Units ("BTUs") of heat by a unit's "baseline" fuel consumption (generally the unit's 1985-87 average). *Id.*[130] Phase II, effective in January 2000, applies to all fossil fuel-fired electricity generating units and employs a somewhat similar method to determine SO_2 allowances.[131] However, for almost all the regulated sources, the emissions rate by which the baseline is to be multiplied is reduced from 2.5 pounds of SO_2 per million BTUs to 1.2 pounds to exact further reductions of SO_2 emissions. In certain instances, the applicable formulae utilize a unit's actual or allowable 1985 emissions rate in determining the number of allowances allocated. *See, e.g.*, CAA §§ 404(a), 405(c), 42 U.S.C. § 7651c(a), § 7651d(c).

According to EPA Enforcement, because of the alleged NSR and PSD violations, the incorrect emissions data from 1985 "*may* have been

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[130]TVA maintains that five of the nine plants at issue in this case were subject to Phase I. TVA Response to Initial Brief at 84. These appear to be Colbert, Allen, Cumberland, Paradise, and Shawnee. *See* CAA § 404 Table A, 42 U.S.C. § 7651c Table A.

[131]As EPA notes, "[t]he allowance allocation scheme established under Title IV is complex, relying on numerous formulae." EPA Enforcement Initial Brief at 57. The summary in the text above is not intended as a comprehensive statement of these formulae.

used" in allocating TVA's SO_2 allowances and "[t]hus the current allocation of SO_2 allowances to TVA plants *may* be improperly inflated." EPA Enforcement Initial Brief at 57 (emphasis added). "Consequently, any plan undertaken to return TVA to full compliance with the Clean Air Act must include the reallocation of SO_2 allowances to TVA. Similarly, to return the environment to where it would have been but for TVA's NSR/PSD violations, TVA should surrender a quantity of allowances equal to the amount of emissions it emitted based upon its reliance on its improper allowances * * *." *Id*. EPA Enforcement further asserts that TVA must offset any excess emissions that occurred as a result of its violations. *Id*. Upon review, EPA Enforcement has failed to convince us that any forfeiture or reallocation of allowances is appropriate under the current state of the record.

Although it is certainly conceivable that the CAA violations at certain of TVA's facilities may have resulted in a misallocation of SO_2 allowances, EPA Enforcement cites to no evidence that any such misallocation actually occurred. Rather, EPA Enforcement merely speculates that the violations may have had some effect on the 1985 SO_2 emission levels and that this may have resulted in TVA being awarded more SO_2 allowances than it would have otherwise been entitled under the applicable allowance formula. Indeed, EPA Enforcement itself acknowledges that it has not completed its analysis on the extent of the violations. *Id*. at 56.[132] As far as we can tell from the record before us, it may well be that once EPA Enforcement has completed its analysis, EPA Enforcement may determine that SO_2 allowances were not

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[132]EPA Enforcement states as follows:

> TVA must comply with a reallocation of its Phase II allowances, which will be performed once the extent of its NSR/PSD noncompliance is ascertained. Second, it must offset emissions equal to the amount of excess allowances it may have relied on for the period beginning in 1995 and ending when the reallocation is complete. Third, TVA must provide emission reductions, perhaps through allowance forfeiture, to offset the excess emissions that occurred under Title I in order to render the Environment whole.

EPA Enforcement Initial Brief at 56.

improperly allocated.[133] Similarly, although EPA Enforcement argues that the environment should be compensated for excess emissions during the period of violation through a surrender of existing SO_2 allowances, EPA Enforcement has not provided the Board with sufficient data to determine if such a surrender is appropriate in this case. *See id*. at 56 n.55 ("At this time, EPA Enforcement has not determined the exact amount of allowances that would have to be retired in order for there to be a sufficient remedy under both Title IV and Title I, but when that amount is determined EPA Enforcement is prepared to seek forfeiture of only that amount.").

Under these circumstances, the record is insufficient to support the surrender of SO_2 allowances contemplated by section IV.1(h) of the Compliance Order. Moreover, based on the representations in EPA Enforcement's own briefs, it appears as if EPA's request for relief is not yet ripe.[134] If, however, upon completion of its analysis, EPA Enforcement continues to believe that a reallocation and/or surrender of SO_2 allowances is appropriate, EPA Enforcement is not precluded by this order on reconsideration from pursuing that avenue of relief in an appropriate proceeding.[135] In any case, for the reasons stated above, we

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[133]We note further, as TVA points out, that although the majority of the projects identified in the Compliance Order were undertaken after 1985 (TVA Response to Initial Brief at 83), section IV.1(h) of the Compliance Order calls for the surrender of allowances equivalent to *all* reductions made pursuant to the Compliance Order. Because EPA Enforcement alleges that unreliable 1985 data may have led to improper allocation, such language in the order would appear to be overbroad in that only the Paradise and Colbert modifications were undertaken during 1985 or before.

[134]We note, as discussed above, that section IV.1(e) of the Compliance Order requires that TVA conduct an audit of each of its coal-fired power plants to determine the extent of any additional violations. Once this audit is completed, EPA Enforcement may have a better understanding of the extent of the violations and the need for the reallocation and/or surrender of any SO_2 allowances.

[135]*See, e.g.*, CAA § 403(f), 42 U.S.C. § 7551b(f) ("Nothing in this subchapter or in any other provision of law shall be construed to limit the authority of the United States to terminate or limit [SO_2 allowances]."); CAA § 113(a)(3), 42 U.S.C. § 7413(a)(3). In addition, we note that 40 C.F.R. part 77 provides procedures whereby owners and operators of units with excess SO_2 emissions are required to offset the amount of such excess emissions. *See* 40 C.F.R. § 77.3(a). Furthermore, the Region may seek penalties for excess SO_2 emissions in the amount of $2000 per ton multiplied by an (continued...)

decline to grant such relief here.[136]

3. *Authority to Require an Audit*

Section IV.1(e) of the Compliance Order states that TVA shall, under the authority of CAA § 114, 42 U.S.C. § 7414,[137]

> provide to EPA an audit of each of its coal-fired power plants that identifies all physical changes made since January 1, 1977 that may have triggered the NSR (both PSD and nonattainment NSR) and NSPS requirements of the Clean Air Act or any applicable state plans.

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[135](...continued)
annual adjustment factor. *Id.* § 77.6(b). We do not decide whether these procedures are or are not applicable in the context of this case.

[136]Because we conclude that EPA Enforcement has not presented sufficient evidence supporting the inclusion of section IV.1(h) in the Compliance Order, we do not address TVA's assertion that EPA Enforcement lacked the authority to include this provision under section 113 of the CAA, 42 U.S.C. § 7413, and the other related arguments TVA raised in its briefs.

[137]Section 114(a) states, in pertinent part:

> For the purpose (i) of developing or assisting in the development of any implementation plan under section 7410 or section 7411(d) of this title * * * [or] (ii) of determining whether any person is in violation of any requirement of such a plan * * *
>
> (1) The Administrator may require any person who owns or operates any emission source * * * who the Administrator believes may have information necessary for the purposes set forth in this subsection, or who is subject to any requirement of this chapter * * * on a one-time, periodic or continuous basis to:
>
> (A) establish and maintain such records;
> (B) make such reports;
> (C) install, use, and maintain such monitoring equipment, and use such audit procedures, or methods; [and]
>
> * * * *
>
> (G) provide such other information as the Administrator may reasonably require * * *.

This request for relief would require TVA to provide certain information for projects conducted from January 1, 1977, through December 31, 1999, "in which any component of an electric utility steam generating unit which has a useful life of more than ten years was replaced, enhanced, redesigned, or otherwise physically altered." The information sought includes the following:

> (i) the cost of the project and where the funds for the project came from (*e.g.* capital expenditure, plant maintenance budget, etc.);
>
> (ii) a description of the project activities, including any and all design changes between the existing component and its replacement;
>
> (iii) the amount of time of the scheduled outage in which the project was carried out;
>
> (iv) the purpose of the project, including any discussion of why the project is needed (*e.g.* forced outage rates, reduced capacity, etc. * * *) and what are the anticipated benefits of the project (*e.g.* life extension of the unit, regained capacity, eliminate derating, etc.);
>
> (v) the age of the unit and the date of the last time this same project or a similar project was undertaken with respect to that unit or any other units at the facility;
>
> (vi) whether the project is part of a series of projects at the unit or facility to regain lost generation, increase capacity or extend the life of the unit or facility;
>
> (vii) the projected future emissions (for NO_x, SO_2, and PM) that will result from the project as would have been calculated by TVA before the project was conducted. The calculated emissions shall include the maximum hourly emission rate as well as the annual emissions increase for NO_x, SO_2, and PM;
>
> (viii) the actual emissions that occurred at the unit and

> the facility for the five years after the project was completed or if the project was completed after November 1995, for each year since the project was completed. The actual emissions shall include the maximum hourly emission rate as well as the annual emissions increase for SO_2, NO_x, and PM.; and
>
> (xi) a conclusion by TVA whether NSR and/or NSPS has been triggered by the physical change based on the information in items (i) through (viii).

Compliance Order § IV.1(e).

TVA asserts that the audit provision is not properly before the Board at this time. TVA Response to Initial Brief at 76. In particular, TVA states that the audit requirement is an information request under CAA § 114, 42 U.S.C. § 7414, and that it is therefore not part of the Compliance Order. Thus, according to TVA, because the Board's jurisdiction in this matter is limited by the Administrator's May 4 Memorandum to conducting proceedings and issuing a decision on reconsideration of the Compliance Order, the Board lacks jurisdiction to consider the audit provision at issue here. TVA Response to Initial Brief at 76-77. TVA further states that the audit provision cannot be made part of the Compliance Order. According to TVA, "[o]nly if TVA refuses to comply with a § 114 information request can it become the subject of a compliance order under section 113(a)(3)." *Id*. at 77.

Examination of the Administrator's Memorandum reveals that the Administrator clearly intended that the Board's proceedings on reconsideration include all material provisions of the Compliance Order, including the audit requirement. The Administrator delegated to the Board the authority "to conduct appropriate proceedings upon reconsideration of the Order cited above." Administrator's Memorandum at 2. On the first page of her delegation memorandum the Administrator states that the term "Order" refers to the November 3 Administrative Order *as well as subsequent revisions.* This would include the Fourth Amended Order and Request for Information. Moreover, the Administrator noted that at a December 20, 1999 meeting between TVA and the Regional Administrator, TVA had requested reconsideration of the Order and submitted its Response to the

Administrative Order. In that response, TVA objected to EPA's authority under CAA § 113 to order TVA to conduct an audit. Thus, TVA's objection to the audit provision was included in documents forming the basis for the Administrator's Memorandum. We therefore read the Memorandum broadly to include all provisions of the Fourth Amended Order and Request for Information, including the audit requirement.

Further, although TVA is correct that the audit provision constitutes an information requirement, the Compliance Order is styled as an order *and request for information*. Thus, the title of the order makes clear that it contains both compliance and information requirements. While TVA may be correct that the audit provision could be the subject of a Compliance Order under CAA § 113(a)(3), 42 U.S.C. § 7413(a)(3), should TVA fail to fully comply, we find nothing improper in the Region's decision to combine a compliance order with an information requirement. TVA's assertions in this regard are therefore rejected.

TVA also questions the reasonableness of the audit provision. TVA does not dispute the Region's authority to require information from regulated power plants under CAA § 114(a), 42 U.S.C. § 7414(a). Rather, TVA argues that the audit provision may be overbroad depending on how it is interpreted by the Region.[138] In this regard, TVA states that it "reserves the right to object on 'reasonableness' grounds" if the Region determines that the information already provided does not meet the audit requirement. TVA Response to Initial Brief at 80.

While we certainly agree with TVA that a request for information under CAA § 114 must be a reasonable one (CAA § 114(a)(1)(G), 42 U.S.C. § 7414(a)(1)(G)), we have reviewed the above-quoted audit provision and conclude that it satisfies this requirement. The information requested bears directly on whether a

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[138]TVA states that on May 22, 2000, it submitted information to the Region satisfying the audit requirement. TVA Response to Initial Brief at 80. To our knowledge, the Region has not responded to TVA's statement regarding the sufficiency of this information. As this issue is not before the Board at this time, we do not reach the question of whether the information provided by TVA satisfies the audit requirement. We would only note that in satisfying the audit requirement, TVA's compliance must be consistent with the Board's interpretations and determinations in this decision.

violation of the CAA has occurred, and the request appears reasonably tailored to elicit that information. That is, sections (i) through (vi) quoted above seek information necessary to determine if any projects were within the scope of the routine maintenance, repair, and replacement exception to the physical change requirement. *See* 40 C.F.R. § 52.21(b)(2)(iii). Sections (vii) and (viii) seek information on whether changes resulted in any emissions increases. Requiring that TVA provide this information does not strike us as unreasonable, especially considering that the Board has already found numerous other violations of the Act. *See supra* Parts III.D-G. Further, as far as we can tell from the record before us, TVA has not indicated that it would be unable to comply with the information request, nor has TVA sought additional time to do so. Under these circumstances, TVA's objections to the audit requirement are rejected.[139]

III. *CONCLUSION*

For the foregoing reasons, we reach the following conclusions.

We conclude that EPA Enforcement has met its burden of establishing that each of the fourteen projects constitutes a physical change under the CAA and applicable regulations and that TVA has not met its burden of establishing that any of the projects fall within the exception for routine maintenance, repair and replacement. In reaching this conclusion we apply the four-factor test advocated by EPA Enforcement and adopted by the Seventh Circuit in its *WEPCO* decision to determine whether a change falls within the scope of the exception. The four-factor test is reasonable and consistent with the statute, regulations, and case law. In contrast, we reject TVA's view of the breadth of the exception as it would, in our view, swallow the rule that subjects existing sources to the requirement to install modern pollution controls when physical changes that increase emissions are made to these plants. In addition, we reject TVA's "fair notice" arguments, concluding instead that the Agency's interpretation was "ascertainably certain" from the regulation's text and its context. Moreover, given the magnitude and circumstances of the projects at issue here, TVA reasonably should have

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[139]TVA has also argued that the audit requirement is not authorized by CAA § 167, 42 U.S.C. § 7477. However, because we conclude that the audit requirement is authorized by section 114(a), we need not address TVA's argument in this regard.

been on notice that these projects may not qualify for the routine maintenance, repair and replacement exception. We also conclude that TVA has not shown that EPA has changed its interpretation of the exception.

Findings of Violations That Are Vacated

We vacate the following findings of violation of the Compliance Order on the grounds that such claims have either been abandoned by EPA Enforcement during the course of this proceeding or that EPA Enforcement failed to sustain its burden of proof with respect to whether the physical changes resulted in an emissions increase:

(1) *NSPS violation at Paradise Unit 3*. EPA Enforcement has abandoned its claim that the physical changes to Paradise Unit 3 violated the NSPS.

(2) *Emissions violation of the NSPS at Colbert Unit 5*. With respect to Colbert Unit 5, EPA Enforcement introduced no evidence as to whether the post-change emissions from Colbert Unit 5 exceeded the NSPS emissions standards of 40 C.F.R. part 60, subpart Da (however, as discussed below EPA Enforcement did demonstrate other NSPS violations at Colbert Unit 5).

(3) *Kentucky minor NSR violations*. EPA Enforcement has abandoned its claims that the physical changes made to Paradise Units 1, 2, and 3 and Shawnee Units 1 and 4 required a Kentucky minor NSR permit.

(4) *PSD or nonattainment NSR claims that EPA Enforcement has abandoned regarding NSR permitting for certain pollutants*. EPA Enforcement abandoned claims that the changes to the following units result in a significant net emissions increase with respect to the following pollutants:

Allan Unit 3 – PM
Cumberland Units 1 and 2 – SO_2
John Sevier Unit 3 – PM
Kingston Unit 6 – PM
Paradise Units 1, 2 and 3 – SO_2 and PM

Shawnee Unit 1 – PM
Shawnee Unit 4 – PM

Accordingly, we vacate the Compliance Order's statements regarding violations for these pollutants at these units.

(5) *PSD or nonattainment NSR violations as to which EPA Enforcement failed to sustain its burden of proof.* EPA Enforcement failed to sustain its burden of proof that the changes to the following units result in a significant net emissions increase with respect to the following pollutants:

Bull Run Unit 1 – PM;
Cumberland Unit 1 – PM;
Cumberland Unit 2 – PM;
John Sevier Unit 3 – NO_X;
Kingston Unit 8 – PM;
Widows Creek Unit 5 – NO_X, SO_2, and PM.

Accordingly, we vacate the Compliance Order's statements regarding violations for these pollutants at these units.

Findings of Violations That Are Sustained

With respect to the following claims of violation for the identified pollutants at the indicated units, we sustain the Compliance Order's findings of violation of the CAA's PSD and/or nonattainment NSR permitting requirements:[140]

	NO_X	**SO_2**	**PM**
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	
Colbert Unit 5	X	X	X

[140]This chart is a reproduction of the Chart No. 2 set forth in Part III.A of this decision, where we provide a more detailed summary of our conclusions.

	NO_X	SO_2	PM
Cumberland Unit 1	X		
Cumberland Unit 2	X		
John Sevier Unit 3		X	
Kingston Unit 6	X	X	
Kingston Unit 8	X	X	
Paradise Unit 1	X		
Paradise Unit 2	X		
Paradise Unit 3	X		
Shawnee Unit 1	X	X	
Shawnee Unit 4	X	X	

With respect to the following claims of violation for the identified pollutants at the indicated units, we sustain the Compliance Order's findings of violation of the minor NSR permitting requirements of the applicable state SIPs:[141]

	NO_X	SO_2	PM
Allen Unit 3	X	X	
Bull Run Unit 1	X	X	X
Cumberland Unit 1	X		
Cumberland Unit 2	X		X
John Sevier Unit 3	X	X	
Kingston Unit 6	X	X	

[141]This chart is a reproduction of Chart No. 3 set forth in Part III.A of this decision, where we provide a more detailed summary of our conclusions.

	NO_X	SO_2	PM
Kingston Unit 8	X	X	X
Colbert Unit 5	X	X	X
Widows Creek Unit 5	X	X	X

We also sustain the Compliance Order's findings of violation of the NSPS performance testing, record keeping and reporting requirements of 40 C.F.R. part 60, subpart Da at Colbert Unit 5.

Sustained and Vacated Remedy Provisions of Compliance Order

With respect to the Compliance Order's remedies for the violations identified above, we briefly summarize here our conclusions and analysis previously set forth in Part III.G. There, we vacate Compliance Order section IV.1(h) regarding surrender of SO_2 allowances subject to our discussion in Part III.G.2.[142] We sustain the requirements that TVA submit schedules for it to come into compliance with the CAA with respect to the violations sustained by this decision and, more generally, the requirements set forth in sections IV.1(a) to (g) of the Compliance Order. We also specifically sustain the requirements that TVA apply for, and obtain, NSR permits for the units and pollutants as to which we have sustained the findings of violation (Compliance Order section IV.1(d)). With respect to the Compliance Order's statements in section IV.1(a) that SCR shall be the minimum controls for NO_X emissions, as more fully discussed in Part III.G.1, we hold that EPA Enforcement shall be bound by its interpretation of such statements as its settlement position and we further hold determination of what constitutes BACT and LAER must be made on a case-by-case basis, by the applicable permitting authority, consistent with the requirements in effect at the time of the permit applications. Subject to our discussion in Part III.G.3, we also sustain the portions of the Compliance Order requiring TVA to perform an audit of its coal-fired electrical generating

[142]As discussed in Part III.G.2 of this decision, if upon completion of its analysis, EPA Enforcement continues to believe that a reallocation and/or surrender of SO_2 allowances is appropriate, EPA Enforcement is not precluded by this order on reconsideration from pursuing that avenue of relief in an appropriate proceeding.

units and remedy violations identified by the audit (Compliance Order sections IV.1(e), (f), (g)).

So ordered.

APPENDIX A
PROJECT-BY-PROJECT FINDINGS REGARDING THE ROUTINE MAINTENANCE EXCEPTION

The following is a detailed discussion of our findings regarding whether the individual projects undertaken by TVA fall within the routine maintenance, repair and replacement exception under NSR.

A. *Allen Plant Unit 3*

The Allen Plant is located in Shelby County, Tennessee and began operations in 1959.[1] The project under review involved a Fall 1992 scheduled outage[2] in which TVA replaced several boiler components, including the existing horizontal reheater with a redesigned reheater. EPA Enforcement Ex. 279, at 17 (Hekking's pre-filed testimony). In reviewing the record, we find several facts significant in applying the four factor test.

1. *Nature and Extent*

TVA began planning this project in 1990. Given the project's significance, approval was required from TVA's Board of Directors. The project, which was managed by TVA's central office instead of the plant's maintenance department, was completed in 1993. During the actual implementation of the project, TVA shut down the unit for three months. EPA Enforcement Ex. 273. In *WEPCO*, the court found the length of the shutdown to bear on the magnitude of the project. *WEPCO*, 893 F.2d. at 911. Although the shutdown time here is shorter than that in *WEPCO*, we nevertheless find it to be significant, given that scheduled

[1]Originally, Memphis Light, Gas and Water Division ran the plant. In July of 1965, TVA began running the plant, and, in 1985, TVA became the sole owner of the plant.

[2]A scheduled outage is a planned shutdown as distinguished from a forced outage which occurs when components or portions of components fail causing the unit to shutdown unexpectedly. Mr. Randolph testified at the hearing that the length of time a forced outage would shut down a unit could range from hours to five days. Tr. at 111. According to Mr. Hekking, a scheduled outage, which typically occurred once every eighteen months, generally lasted four weeks. Tr. at 225.

maintenance outages are typically limited to four weeks. *See* Tr. at 225. The extent of this project is illustrated by Mr. Hekking's testimony, in which he states:

> The entire boiler was stripped of external lagging and insulation to make access for the structural modifications required for the conversion from positive furnace pressure to negative. An opening was cut in the furnace sidewall and a platform constructed for the removal and reinstallation of the reheater elements. A railroad track was built from the platform into the building for the movement of the elements back and forth. The building's structural steel was reinforced to support the additional weight. A monorail system was constructed inside the boiler to move the elements in and out, onto a trolley built for the railroad track to run between the boiler and the outside platform. The old elements were cut loose from the boiler, loaded onto the trolley, and rolled out to the platform where a mobile crane picked them up and set them onto trucks for hauling to a storage area. The new elements were brought into the boiler in the reverse manner. A total of 540 reheater elements, arranged in six banks, or sections, were removed and re-designed replacements were installed.

EPA Enforcement Ex. 279, at 17 (Hekking's pre-filed testimony). TVA replaced approximately 44% of the 234,219 square feet of total boiler surface in this project. TVA Ex. 4, at 31 (Golden's pre-filed testimony).

2. *Purpose*

The purpose of this project is described in TVA's work order, which cites the elimination of current failures and deratings resulting from slagging as among the purposes for this project. EPA Enforcement Ex. 51. TVA further explains the project in its records that the project would address tube failures at a reheater that was thirty years old in 1990 and thus approaching the end of its productive life. EPA Enforcement Ex. 53. Indeed, TVA's work order explains that the tube failures indicate "an end of life failure mode." EPA Enforcement Ex. 63. Thus,

this project was intended to extend the life of the unit.

Moreover, the construction project was funded through the central office's capital budget.[3] As explained in some detail *supra* Part III.C of this decision, under TVA's capitalization policy, this classification shows TVA's intent to improve the unit, not merely to maintain it.

3. *Frequency*

The record indicates that this project was the only one of its kind in the unit's lifetime. EPA Enforcement Ex. 279, at 17 (Hekking's pre-filed testimony). TVA does not dispute this fact; however, it emphasizes that similar projects had occurred with some frequency within TVA and in the utility industry generally. *See* TVA Ex. 4, at 10 (Golden's pre-filed testimony). Specifically, TVA argues that repair or replacement of damaged reheater tubing either when it fails or prior to its failure was a "utility practice * * * in place long before the New Source Review regulations were contemplated. Since 1977, TVA has performed ninety-three reheater replacement projects (only forty-nine of TVA's fifty-nine units have reheaters)." *Id.* at 31. Moreover, TVA argues that when compared to the cost and time shutdown of the project under review in *WEPCO* (the *WEPCO* project), the Allen Unit 3 project is routine.

As we noted earlier in Part III.C.3 of this decision, we think the relevant inquiry regarding frequency focuses most importantly on the significance of the project in the life of the unit in question, and this evaluation can be informed by the frequency of the activity at other units within the industry. This point was emphasized by the *WEPCO* court when it stated that "the renovation work items * * * are those that would normally occur only once in a *unit's* expected life cycle." *WEPCO*, 893 F.2d at 912 (emphasis added). TVA's evidence does not establish that reheater replacements were routine within the life of a unit like Allen Unit 3. Rather, they are uncommon events in the life of such a unit. Moreover, we have previously rejected the notion that the mere fact that others in the industry have done this type of replacement makes it

[3]This fact is also significant in examining the cost element of the four-factor test.

"routine." *See supra* Part III.C.3.

4. *Cost*

TVA's Fossil and Hydro Modifications Division at the central office performed this project at an approximate cost of $10.78 million.[4] Mr. Hekking testified that the project could not have been funded through the plant's O&M budget because the entire O&M budget for Allen's three units combined was less than the project's cost.[5] *See* Tr. at 245.

As discussed above, TVA argues, generally, that EPA Enforcement's comparison of the O&M budget of the plant to the cost of the project is misleading because the O&M budgets do not include the "entire spectrum of routine maintenance, repair and replacement." TVA asserts that, "yearly plant maintenance budgets are intended to cover day-to-day minor maintenance activities that the plant maintenance staff conducts, but they do not cover common maintenance, repair and replacement activity that TVA has found more cost-effective to centralize * * *." TVA Post-Hearing Brief at 34-35. This statement notwithstanding, we find the fact that the individual plant's O&M budget was less than the cost of many of these projects is quite relevant where it shows the extensive nature of the project in relation to daily and "running maintenance" handled by the plant's maintenance department.

On balance, we find that, considering the evidence in the record and applying the four factor test, TVA has not established that its project at the Allen Plant Unit 3 comes within the scope of the routine maintenance exception. Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for this or a like project that would support a finding that this project constituted routine maintenance, repair and replacement.

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[4]The parties have different cost figures for the project. However, both parties agree that the differences are not that great and are, therefore, not relevant. Tr. at 338-40. We will use EPA's figures, which were obtained from TVA records.

[5]Mr. Hekking estimated the O&M budget for the Allen plant in the early 1990s to be $9.5 million. Tr. at 245.

B. *Paradise Plant Units 1, 2, and 3*

The Paradise plant is located in Drakesboro, Kentucky. Units 1 and 2 began commercial operations in 1963, and Unit 3 began in 1970. In 1985,[6] TVA performed a series of replacements at the Paradise plant's Units 1, 2, and 3. The significant facts from the record are highlighted below using the four factor test as a framework.

1. *Nature and Extent*

The work was essentially the same at all three units. It included the replacement of all cyclone burners attached to each boiler and the replacement of the lower furnace walls, floor and headers. EPA Enforcement Ex. 273; EPA Enforcement Ex. 279, at 40-42 (Hekking's pre-filed testimony); TVA Ex. 4, at 23-26 (Golden's pre-filed testimony).

Through these projects, TVA replaced all fourteen cyclone burners at each of Units 1 and 2 and replaced all twenty-three cyclone burners at Unit 3. In addition, TVA cut out and replaced the waterwall below 465 feet, including the lower headers and floor at Unit 1. TVA performed the same work at Unit 2. At Unit 3, in addition to the twenty-three cyclones, TVA replaced the waterwalls between 418 feet to 501 feet. TVA Ex. 4, at 23-25 (Golden's pre-filed testimony); EPA Enforcement Ex. 279, at 42 (Hekking's pre-filed testimony).

The magnitude of the work at each of these units was significant. Indeed, TVA had to construct monorails at the front and rear walls for lifting and positioning the cyclones at each unit. EPA Enforcement Ex. 279, at 43 (Hekking's pre-filed testimony). TVA installed a trolley system to transport the cyclones in and out of the building, and TVA constructed rigging inside the furnace to assist in attaching the wall panels and floor panels. *Id.*

After approval from the Board of Directors and after years of

[6]The work at Unit 1 began in March of 1985; the work at Unit 2 began in November of 1985; and the work at Unit 3 began in October of 1984. *See* TVA Ex. 4, at 23-26 (Golden's pre-filed testimony).

planning, the central office's Fossil and Hydro Power Division performed work on these units sequentially.[7] TVA implemented the work at Unit 3 first, beginning in the Fall of 1984 and requiring the unit to be shut down for six months. It then worked on Unit 1, shutting it down for approximately 6.5 months beginning in March of 1985. Finally, TVA performed the work on Unit 2 beginning in November of 1985 and lasting 4.5 months. In each case, the units were shut down for periods well beyond the four weeks typical of scheduled maintenance outages.

The work at Unit 1 and 2 required the replacement of approximately 18.5% of the total tubing in the boiler. TVA Ex. 4, at 23, 25 (Golden's pre-filed testimony). TVA replaced approximately 19.4% of the total tubing in Unit 3's boiler. *Id.* at 26.

2. *Purpose*

The central office's Fossil and Hydro Power Division recommended these projects at all three units in order to increase each unit's availability and reliability by decreasing the number of forced outages, as well as to extend the life of these units by twenty years. *See* EPA Enforcement Exs. 3, 4, 6, 9. Apparently, TVA had in the past repaired and replaced individual tubes in the waterwalls, floors and the cyclones, but the forced outages continued to increase. EPA Enforcement Ex. 279, at 40 (Hekking's pre-filed testimony); EPA Enforcement Ex. 16. Additionally, TVA classified these projects as capital projects and thus intended these projects to improve the units, not merely to maintain their present condition.

3. *Frequency*

The work performed on these units was the first and only of its magnitude at these units. EPA Enforcement Ex. 279, at 43 (Hekking's pre-filed testimony). TVA points out that cyclone replacements had

[7]A factual inconsistency exists between TVA and EPA Enforcement regarding the actual dates of each units' renovation. However, the length of time is substantially the same under either party's facts. *See* TVA Ex. 4 (Golden's pre-filed testimony); EPA Enforcement Ex. 279 (Hekking's pre-filed testimony).

been done within the industry and at TVA in the past. TVA Ex. 4, at 24 (Golden's pre-filed testimony). TVA's proof, however, falls short of suggesting that this work is common in the lives of individual units of this kind.

4. *Cost*

TVA's central office performed these projects at an approximate cost of $16.3 million for Unit 1,[8] $15.79 million for Unit 2, and $29.44 million for Unit 3. *See* EPA Enforcement Ex. 273. Additionally, given the size of the Paradise plant, it is probable that, similar to the Allen Plant, Paradise's O&M budget could not have supported such projects while meeting other maintenance needs.[9]

On the whole, TVA has not established that these projects fall within the "routine" exclusion when the four factor test is applied to the facts. Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for these or like projects that would support a finding that these projects constituted routine maintenance, repair and replacement.

C. *Bull Run Unit 1*

The Bull Run Plant is located in Anderson County, Tennessee and began operations in 1967. Unit 1 began to experience tube leaks in its economizer section that increased in frequency and duration. Additionally, there were tube leaks in the secondary superheater tubing, caused by deterioration of the tube material from twenty years of service. In applying the four factor test, we, based on our review of the record, find several facts significant to each factor.

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[8]At the hearing Mr. Majoros compared the cost of the project to the cost of the original installation of the unit in real dollars. The cost of the project was approximately a third of the original installation cost. *See* Tr. at 357-58.

[9]Although the only plant-specific O&M budget referenced in the record is for the Allen Plant in the early 1990s, we assume both that it is representative of O&M budgets for TVA plants of that size and a useful benchmark for estimating O&M budgets at other TVA plants. *See* Tr. at 245.

1. *Nature and Extent*

The project, which required approval by TVA's Board of Directors and was managed by TVA's central office, required the removal and replacement of over sixty-seven miles of two-inch diameter tubing from the economizers in both furnaces at Unit 1. EPA Enforcement Ex. 279, at 21 (Hekking's pre-filed testimony). In replacing the secondary superheater in both furnaces, TVA removed and replaced over 58,000 feet of tubing. EPA Enforcement Ex. 73; EPA Enforcement Ex. 279, at 21 (Hekking's pre-filed testimony). Four separate sections of the unit were involved in this project – the economizer in the lower rear section of the furnace and the secondary superheater in the upper convection section, for each of the two furnaces. EPA Enforcement Ex. 279, at 21 (Hekking's pre-filed testimony). After years of planning, the project was completed in 1988. In order to implement the project the unit remained shut down for a three-month time frame, beyond the four weeks typical of scheduled maintenance outages. TVA replaced about 26.5% of the total tubing in the boiler. TVA Ex. 4, at 20, 22 (Golden's pre-filed testimony).

2. *Purpose*

TVA concluded that the leaks in the tubing would escalate if left unaddressed. EPA Enforcement Ex. 72. In 1986, the Fossil and Hydro Power Division recommended to TVA management the replacement of the economizer and the secondary superheater components of the unit to "reduce the number of forced outages, increase the availability and reliability of the unit, and [to] extend the life of this section of the boiler by approximately 20 years." EPA Enforcement Ex. 72; *see also* EPA Enforcement Exs. 73, 74. Like all projects at issue in this case, TVA classified this project as a capital project; thus, TVA intended the project to improve the condition of the unit, not merely restore and maintain it.

3. *Frequency*

This project was the only one of its kind in the unit's history. EPA Enforcement Ex. 279, at 20 (Hekking's pre-filed testimony). TVA raises very similar arguments for its defense of routine maintenance, repair and replacement at this unit as it did for the other projects. TVA placed into the record testimony regarding the frequency at which similar

projects have occurred within TVA's plants and throughout the industry. Nowhere did it establish, however, that those replacements took place other than rarely in the lifetime of a unit like this one.

4. *Cost*

The total capital cost of the project (including replacement of both economizers and secondary superheaters) was approximately $8.3 million. EPA Enforcement Ex. 279, at 23 (Hekking's pre-filed testimony). Additionally, as discussed *supra* Part III.C of this decision, it is probable that Bull Run's O&M budget could not have supported such a project while meeting other maintenance needs.

Under the four-factor test, we look at more than just frequency of one-time facility events in the industry to determine whether a project falls within the routine maintenance exception to the NSR regulations. Here, TVA did not establish that the Bull Run Plant Unit 1 project falls within the exception for "routine maintenance, repair and replacement." Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for this or a like project that would support a finding that this project constituted routine maintenance, repair and replacement.

D. *Colbert Plant Unit 5*

The Colbert Plant is located in Tuscumbia, Alabama. The plant began operating in 1965. In 1983, TVA undertook a major overhaul of Colbert Unit 5. The significant facts from the record are highlighted below using the four-factor test as a framework.

1. *Nature and Extent*

The project involved replacement of the waterwalls and horizontal reheater, modification of the startup system, modification of the superheater by adding wingwalls in the furnace, replacement of gas proportioning dampers, replacement of the windbox, redesigning and replacement of the control system, and addition of a balanced draft

conversion system.[10] Indeed, as Mr. Golden testified, "[i]t was the largest unit rehabilitation project that TVA had ever undertaken." Tr. at 743. Although TVA completed the renovations in 1983, it began planning the project in the late 1970s. The central office planned and, after approval by the Board of Directors, performed the project during a thirteen-month shutdown, substantially beyond the four-week period typical of scheduled maintenance outages.

2. *Purpose*

The record reflects that TVA had determined that by changing from pressurized to balanced draft firing, it could significantly increase the unit's annual output, which would also reduce the number of forced outages and deratings resulting from the gas leakage from the unit. *See* EPA Enforcement Ex. 44; EPA Enforcement Ex. 279, at 26 (Hekking's pre-filed testimony). Further, the record establishes that the project was undertaken because of the boiler's deteriorated state and the control system's inadequacy. EPA Enforcement Ex. 36. TVA stated in its proposed project authorization:

> Attached is a proposed project authorization for $46,848,650 to rehabilitate and modify the Colbert unit 5 boiler, turbine, and control system. The outage rates on this unit continue to increase to intolerable levels because of the combined effect of several inadequate features associated with this prototype equipment. This work is expected to show a significant improvement in reliability and load-carrying capability and extend the useful life of the unit for 20 years.

EPA Enforcement Ex. 27. Further, TVA's classification of this project as a capital project shows that TVA intended to improve the condition of the unit, not merely maintain it.

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[10]EPA Enforcement notes that the conversion of the boiler to a balanced draft system, which uses negative pressure, represented a fundamental change in the boiler's control of the combustion process, whereas prior to the construction, the system used positive pressure. EPA Enforcement Ex. 279, at 26 (Hekking's pre-filed testimony).

3. *Frequency*

TVA implemented this project to fix a unit that was not working as designed. Accordingly, the project included modifications on a major scale and resulted in a fundamental change in the manner Unit 5 was operated. It thus seems self-evident that the project was extraordinary in nature and scope and was the kind of project that would only rarely be undertaken in the lives of most units of this kind. EPA Enforcement Ex. 279, at 27 (Hekking's pre-filed testimony).

4. *Cost*

TVA spent approximately $57.1 million on this construction project, which required over a year to complete. EPA Enforcement Ex. 204. As with the other projects, the funding for the project came from TVA's capital budget. The cost of the work -- $57.1 million -- certainly was substantial in absolute terms and required approval by TVA's Board of Directors. *See* EPA Enforcement Ex. 279, at 15 (Hekking's pre-filed testimony). Moreover, it is not difficult to conclude that Colbert's O&M budget could not have been adequate for the project, given its high costs.

In this instance, TVA argues that Unit 5 was a prototype and, therefore, subject to problems. *See* TVA Ex. 4, at 29 (Golden's pre-filed testimony). TVA argues that it is common in its industry for prototype units to require corrective action. Additionally, Mr. Golden testified that "it would have been unprecedented in the industry then, and in the industry now to walk away from a coal-fired plant that early in its life."[11] *Id*. TVA points out that the unit was only seventeen years old when construction activities began. Additionally, TVA points out that each of the components replaced at Unit 5 have been replaced on a frequent basis within TVA.[12] TVA again concludes that the Colbert Unit 5 project was

[11]Mr. Golden's testimony misses the point. NSR regulations would not prohibit the work TVA performed at Unit 5 but rather require TVA to obtain a permit before constructing.

[12]In Golden's pre-filed testimony, TVA does not address whether TVA or any-one in the industry had ever implemented a similar rehabilitation in the aggregate or (continued...)

routine when compared to the *WEPCO* project, which extended the useful life of the units in question. Moreover, TVA argues that Colbert's cost in comparison to *WEPCO*'s was significantly less.[13]

Although TVA appears not to have implemented these projects at Unit 5 solely to extend the useful life of the seventeen-year-old unit, many other facts persuade us that the rehabilitation of Unit 5 was nonetheless not "routine maintenance, repair and replacement." The Board in particular finds the magnitude of the renovation, the length of time required to plan and implement the project, and the duration of the outage caused by the work at Unit 5 to be significant facts that cut against considering this construction work to be "routine." Indeed, it looks anything but routine. Moreover, since the project's purposes included increasing the unit's reliability, increasing its load-carrying capability by decreasing the number of outages experienced at the unit, and extending the life of the unit, this too shows the project was not routine and went beyond mere restoration of the unit to its former condition prior to the work. TVA's use of the capital budget for this project also reinforces the conclusion that TVA intended this work would leave the unit in an improved condition.[14] *See* EPA Enforcement Ex. 152.

On balance, although we recognize there are differences between this project and the others at issue in this case, TVA has not established that the work at Colbert Unit 5 to be "routine, maintenance, repair and replacement." Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for this or a like project that would support a finding that this project constituted routine maintenance,

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[12](...continued)
how frequently any such replacement of individual components were in the life of the individual units.

[13]TVA cites comparison figures between Colbert Unit 5 and *WEPCO*'s projects as $103.85 per kilowatt ("kw") versus $220/kw, respectively.

[14]The work TVA did at Unit 5 not only replaced components but improved the unit. Examples of these improvements to the unit include: the addition of wingwalls in the furnace, the redesign of the windbox to improve air distribution, and the conversion to a balanced draft system. *See* EPA Enforcement Ex. 22.

repair and replacement.

E. *Cumberland Plant Units 1 and 2*

The Cumberland Plant is located near Cumberland City, Tennessee. The units involved in this case, Units 1 and 2, began operating in 1973. This plant is the newest and largest plant in TVA's system. The record reveals several significant facts regarding these projects.

1. *Nature and Extent*

As detailed in TVA's scoping specification memo for the Cumberland plant, prior to the renovations both units were experiencing forced outages due to the need to repair secondary superheater tube leaks the unit had been experiencing. EPA Enforcement Ex. 111. In 1988, TVA's central office recommended the complete replacement of both secondary superheater outlet headers and 1,460 terminal tubes, asbestos insulation removal, insulation installation, and structural steel reinforcement for Unit 1. EPA Enforcement Ex. 81. In 1996, after TVA's Board of Directors approved the project, TVA's central office managed the work at Unit 1. EPA Enforcement Ex. 273.

Regarding Unit 2, in 1994, after TVA's Board of Directors approved the project, TVA's central office managed the replacement and redesign of the secondary superheater outlet headers, the replacement of the secondary superheater pendant elements and the replacement of the lower slope and lower waterwalls. *See* EPA Enforcement Exs. 103, 105, 273. The headers alone were over 110-feet long and "were massive pieces of metal with intricate machine work for the more than 700 tube stub holes, outlet steam piping, and other attachments," weighing over eighty tons each. EPA Enforcement Ex. 279, at 31-32 (Hekking's pre-filed testimony).

The projects at both units took three months to complete once

on-site activity began and several years of planning[15] prior to implementation. Again, the three-month shutdown went well beyond the four weeks typical for scheduled maintenance outages. EPA Enforcement Ex. 273.

2. *Purpose*

TVA explained that the work was required for Unit 1 because the secondary superheater headers had been prone to thermal fatigue cracking and this cracking decreased the unit's availability to generate power. *Id*. "In their present condition, these headers cannot be safely or reliably operated for more than 3 years." *Id.* Thus, the purpose of these projects was to eliminate forced outages, increase capacity at both units and extend the life of the unit. In addition, TVA replaced the secondary superheater pendant elements and replaced the lower slope and lower waterwalls at Unit 1. EPA Enforcement Ex. 279, at 31-32 (Hekking's pre-filed testimony); EPA Enforcement Ex. 273. TVA funded both projects as capital projects, intending both projects to improve, rather than simply maintain, each unit's condition.

3. *Frequency*

The two projects at Unit 1 and Unit 2, respectively, replaced at substantial cost a number of key boiler components that had never been replaced on either unit.

TVA contends that utilities commonly replace components that "pose a threat to employee safety or the unit's ability to reliably generate electricity." TVA Ex. 4, at 35 (Golden's pre-filed testimony). The fact that this may have been one of their purposes does not, by itself, determine the outcome of whether the work was "routine."[16] TVA does acknowledge that replacement of superheater headers is done less

[15]TVA took eight years to plan the project at Unit 1 and six years to plan the project at Unit 2. *See* EPA Enforcement Ex. 80.

[16]We do not doubt that components at older units may have safety and reliability issues, but in our view this does not alone establish whether or not the replacement was "routine."

frequently, but states that "TVA has historically replaced headers when conditions justify such replacements." *Id.* TVA's evidence falls short of demonstrating that such replacements are anything other than uncommon events within the life of units like Cumberland Units 1 and 2.

4. *Cost*

The work performed at Unit 1 was in excess of $22 million, and TVA spent over $18 million on the project at Unit 2. It is probable that the O&M budget for this plant would not have been sufficient to finance these projects and meet other maintenance needs.

Based on the totality of the facts, the Board finds that TVA has not met its burden to establish that the projects at Unit 1 and 2, in 1996 and 1994, respectively, were "routine maintenance, repair and replacement." Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for these or like projects that would support a finding that these projects constituted routine maintenance, repair and replacement.

F. *John Sevier Plant Unit 3*

The John Sevier Plant is located in Hawkins County, Tennessee. Unit 3 at the plant began operations in 1956 and has a rated capacity of 135 MW. In the 1980s, Unit 3 began to experience problems in the waterwalls due to extensive tube failures, and TVA accordingly initiated work orders for the Unit 3 work in the mid-1980s. In reviewing the record, the Board found several facts significant in its application of the four factor test.

1. *Nature and Extent*

The central office's Fossil and Hydro Power Division recommended to its management that TVA replace the complete boiler set of superheater platen elements, replace eight burner tube panels in both furnaces, and replace all waterwall tubes in portions of the front, rear, and sidewalls. TVA's project included replacing the waterwall tubes on the rearwall from 1097 feet to 1164 feet; on the sidewalls and

frontwall in both furnaces up to 1,197 feet.[17] EPA Enforcement Ex. 67. The boiler construction section at TVA's central office was responsible for the project's planning and implementation. After its Board of Directors approved the project and years of planning, TVA initiated on-site activities in 1986 and required the unit to shut down for 2.5 months in order to replace the waterwalls, beyond the four weeks typical of scheduled maintenance outages. The work performed at this unit replaced approximately 8% of the tubing in the entire boiler. TVA Ex. 4, at 12-14 (Golden's pre-filed testimony).

2. *Purpose*

TVA undertook this work in order to extend the life of the unit by approximately twenty years and to improve its reliability. *See* EPA Enforcement Exs. 65-67. Indeed, TVA's classification of the project as a capital project shows TVA's intent to improve the unit, not merely to maintain it.

3. *Frequency*

This project was the first time in the unit's lifetime that these components had been replaced. TVA argues that the project constituted routine maintenance, repair and replacement because replacement of damaged waterwalls is common practice within the utility industry.[18] TVA Ex. 4, at 12 (Golden's pre-filed testimony). TVA's evidence falls short, however, of showing that such replacements are anything but rare

[17]There is an apparent inconsistency in the record on these facts. In Golden's testimony, he states that sixty-seven feet of the rear waterwall was replaced and that 100 feet of the side and front waterwalls was replaced. *See* TVA Ex. 4 (Golden's pre-filed testimony). The inconsistency may be explained by TVA's separation of the project into several projects. *See id.* at 12-14. The Board will rely on TVA's work order as the accurate description of the project. *See* EPA Enforcement Ex. 67.

[18]Further, Golden states, "A survey of maintenance practices of other coal-burning electric utility units, representing more than 20% of the total electricity generation capability in the United States, revealed that of a population sample of 219 utility boilers, 174 waterwall replacement projects had been performed since 1977." TVA Ex. 4, at 12 (Golden's pre-filed testimony). This testimony does not, however, establish that these replacements were common in the life of any particular unit, which, as noted above, is an important aspect of the analysis.

in the life of a unit like Unit 3.

4. *Cost*

The project was classified as a capital project, costing TVA approximately $3.94 million to complete. EPA Enforcement Ex. 279, at 35 (Hekking's pre-filed testimony). Again, given the size of this plant and the cost of this project, it is probable that the O&M budget for the plant would not have been sufficient to finance this project while meeting other maintenance needs.

Based on these facts, the Board finds that TVA has not met its burden of establishing that the 1986 project at the John Sevier Plant Unit 3, based on all the evidence in the record, constitutes "routine maintenance, repair and replacement." Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for this or a like project that would support a finding that this project constituted routine maintenance, repair and replacement.

G. *Kingston Plant Units 6 and 8*

The Kingston Fossil Plant is located in Roane County, Tennessee. The plant has nine generating units, two of which are at issue in the present matter -- Units 6 and 8. Both units began operations in 1955. The renovations at issue involve the replacement of key components at Units 6 and 8 in the Spring and Fall of 1989, respectively.

1. *Nature and Extent*

After gaining TVA's Board of Directors approval, TVA's central office performed essentially the same work at both units. The work included replacing all reheater and superheater intermediate pendant elements and the lower waterwalls of the superheater and reheater furnaces. *See* EPA Enforcement Ex. 279, at 36-37 (Hekking's pre-filed testimony); TVA Ex. 4, at 15-19 (Golden's pre-filed testimony). TVA's central office began planning these projects in 1987 at the latest. *See* EPA Enforcement Exs. 122, 123, 126. TVA shut down Unit 6 for approximately two months to perform this project and shut down Unit 8 for a three-month period, *see* EPA Enforcement Ex. 273, thus going beyond the four weeks typical of scheduled maintenance outages.

The work on Unit 6 for the replacement of the reheater and superheater intermediate pendent elements involved replacement of 12,855 square feet of surface area, approximately 9% of the total superheater and reheat surface in the boiler. TVA Ex. 4, at 15 (Golden's pre-filed testimony). The work on the lower waterwalls at Unit 6 replaced approximately 5% of the 70,600 square feet of waterwall surface. *Id.* at 17. TVA's replacement of the superheater crossover tubes at Unit 6 represented less than 3% of the total amount of tubing in the unit. *Id.* at 18. And at Unit 8 the work involving the reheater and superheater required the replacement of approximately 9% of the total superheater and reheater surface at the unit. *Id.* at 19.

2. *Purpose*

TVA's records show that the purpose of these projects was to replace components that "have operated beyond their designed life and have deteriorated because of long-term overheating causing failure due to creep." EPA Enforcement Ex. 126. TVA justified the cost of these projects because the replacement would increase the reliability and availability of the units. *See* EPA Enforcement Exs. 122, 123, 126. In its 1986 work order for Unit 8's superheater replacement, TVA stated that the replacement of the superheater elements would "extend the life of this portion of the boiler by approximately 20 years." EPA Enforcement Ex. 126. Thus, TVA classified these projects as capital projects, which under TVA's own policy were intended to improve the condition of the units, not merely maintain them.

3. *Frequency*

The record indicates that these projects at Units 6 and 8 were the first replacements of this magnitude for these components, and TVA offered no evidence that such replacements have since occurred at those units. TVA had performed smaller less-extensive replacements at these components in the past, but this does not diminish the significance of the projects under review.

TVA argues that these projects are routine because they are commonly done in TVA's system and the utility industry, generally. TVA Ex. 4, at 15-19 (Golden's pre-filed testimony). As we have said, the fact that others in the industry have done similar projects does not

alone assist in determining whether the project falls within the routine maintenance exception. TVA's evidence does not demonstrate that such replacements are anything other than uncommon events within the life of units like Units 6 and 8.

4. *Cost*

TVA's Fossil and Hydro Modifications Division at the central office performed these projects at an approximate capital cost of $2.6 million for Unit 6 and $2.9 million for Unit 8. It is probable that the O&M funds available for these units would have been insufficient to finance this work while meeting other maintenance needs. Again, TVA compares the separate replacement costs at each of Units 6 and 8 with WEPCO's complete cost and claims that TVA's separate replacements were substantially less that the entire cost of WEPCO's modification. TVA Ex. 4, at 15-19 (Golden's pre-filed testimony). The determination that a project is nonroutine does not require a mere cost comparison with *WEPCO;* rather, a case-by-case determination using the four-factor test is required.

After reviewing the record on these two units, the Board concludes that, based on the facts as a whole, TVA has not met its burden of establishing that the projects performed at Units 6 and 8 were "routine." Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for these or like projects that would support a finding that these projects constituted routine maintenance, repair and replacement.

H. *Shawnee Plant Units 1 and 4*

The Shawnee Plant is located in McCracken County, Kentucky. In 1953, Units 1 and 4 began commercial operations. The projects involved in this matter were carried out in the Fall of 1989 and the Spring of 1990 at Units 1 and 4, respectively. The Board finds that following facts from the record to be significant.

1. *Nature and Extent*

TVA replaced the following items at each unit: "the secondary and reheat superheater pendant and crossover elements including header

stubs." EPA Enforcement Exs. 133, 136. The planning required several years to complete. *Id.* These projects were also approved by TVA's Board of Directors and were managed by TVA's central office. TVA funded these projects, like all others at issue, through the capital budget. During the actual implementation of the project at Unit 1, TVA shut down Unit 1 for three months. EPA Enforcement Ex. 134. TVA completed the work at Unit 4 in two months. EPA Enforcement Ex. 137. Both of these projects required a shutdown beyond that of the typical scheduled maintenance outage of four weeks. Additionally, these projects required the replacement of over 132,612 feet of tubing at each unit and represented approximately 37% replacement of total tubing at each unit. TVA Ex. 4, at 32 and 33 (Golden's pre-filed testimony).

2. *Purpose*

The central office recommended the projects because inspections of these components had revealed that the tubing was badly deteriorated and that, if not replaced, the rate of tube failures would increase. Thus, these projects were implemented to reduce the number of forced outages at the unit and prevent the continuing increase of those outages. EPA Enforcement Exs. 133, 136. These projects also extended the life of the units. EPA Enforcement Ex. 279, at 46 (Hekking's pre-filed testimony). TVA's classification of the projects as capital projects, further reinforces that TVA intended these projects to improve the condition of the units, not only to maintain them.

3. *Frequency*

Similar projects had never been performed on these units in their thirty-six years of operation. EPA Enforcement Ex. 279, at 46 (Hekking's pre-filed testimony). Again, TVA argues that replacements of this kind were commonly performed at TVA and industry-wide. Thus, TVA concludes, the projects at Units 1 and 4 were routine. However, TVA has offered no evidence that similar improvements are anything other than rare in the life of units of this kind, a factor that we find more instructive.

4. *Cost*

TVA implemented these projects at an approximate capital cost of $4.5 million for Unit 1[19] and $5 million for Unit 4. *See* EPA Enforcement Ex. 279, at 46 (Hekking's pre-filed testimony); EPA Enforcement Ex. 273. Given the size of these units and the cost of these projects, it is probable that the plant's O&M budget would have been insufficient to finance these projects while meeting other maintenance needs.

Again, based on the facts in the record, the Board concludes that TVA has not met its burden to establish that the projects TVA undertook at the Shawnee Plant Units 1 and 4 projects were "routine." Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for these or like projects that would support a finding that these projects constituted routine maintenance, repair and replacement.

I. *Widows Creek Plant Unit 5*

TVA's Widows Creek Plant is located in Jackson County, Alabama. The plant began commercial operations in 1952. However, Unit 5 did not begin operating until 1954. The final project in this case involves a Fall 1989 scheduled outage at this unit.

1. *Nature and Extent*

TVA replaced all of the secondary superheater pendant elements, reheater elements, and crossover elements. Additionally, TVA redesigned the tubing to use better materials. *See* EPA Enforcement Ex. 279, at 47-50 (Hekking's pre-filed testimony); TVA Ex. 4, at 32 (Golden's pre-filed testimony); EPA Enforcement Ex. 46. TVA took several years to plan the project at Unit 5, and, after TVA's Board of Directors' approval, took approximately four months to complete the work, significantly longer than the four weeks required for typical

[19]Mr. Majoros compared the cost of the project at Unit 1 with the cost of the original installation of the unit in real dollars and found the project represented approximately 45% of the original installation cost. *See* Tr. at 362.

schedule maintenance outages.[20] EPA Enforcement Exs. 46-47. The work, managed by TVA's central office, required replacement of approximately 43.5% of the total feet of tubing in the boiler. TVA Ex. 4, at 34 (Golden's pre-filed testimony).

2. *Purpose*

TVA's work order for Unit 5 indicates that the project would extend the life of the unit: "the existing tubes are failing because of creep damage experienced while operating at high-temperatures. This indicates that these tubes have reached the end of life." EPA Enforcement Ex. 46. As with all the other projects previously discussed, TVA classified this project as a capital project, thus intending the project to improve the condition of the unit, not merely to maintain it.

3. *Frequency*

The work was the first and only replacement of the components in the lifetime of the unit. TVA argues, as it has regarding all of these projects, that the project at Unit 5 must be characterized as routine because many similar projects have been performed by TVA, as well as by others in the utility industry. For the reasons already discussed at length, we reject this argument again because it ignores other relevant facts that must be reviewed in determining whether a project falls within the routine maintenance repair and replacement exception. TVA has not, for example, offered any evidence that similar improvements have been made to this unit prior to the project or since or that such improvements are anything other than uncommon in the lives of units of this kind.

4. *Cost*

TVA performed this project at an approximate capital cost of $4.13 million. Given the cost associated with this project, it is probable that the O&M funds for this plant would not have been sufficient to

[20]Golden submitted testimony that TVA implemented the project in a little over two months (October 2, 1989 to December 18, 1989); however, TVA's own completion report for the project indicates that construction began in September 1989 and finished in January 1990. *See* TVA Ex. 4, at 34 (Golden's pre-filed testimony); EPA Enforcement Ex. 47.

finance this project while meeting other maintenance needs.

On the whole, TVA has not met its burden of establishing that this project was "routine maintenance, repair and replacement." Notably, TVA cites to no applicability determination issued by EPA or the relevant state authority for this or a like project that would support a finding that this project constituted routine maintenance, repair and replacement.