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EPA, TVA, AND POLLUTION CONTROL: A COMPARATIVE ANALYSIS OF INTRAGOVERNMENTAL POLICY IMPLEMENTATION

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Robert F. Durant

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DEDICATION

To Gladys Mary Durant

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ABSTRACT

Of late the substance, organization, and context of federal policies have been altered. This study examines one manifestation of these developments: the burgeoning necessity of one federal agency having to hold another accountable to national policy goals. Its analytical focus is the Environmental Protection Agency's experience with the Tennessee Valley Authority during the former's implementation of the Clean Air Act and the Federal Water Pollution Control Act. Specifically examined are EPA's efforts to apply SO_2 and thermal pollution control policies to the TVA power program during the 1970's. Using a comparative case study design, the divergent responses of TVA to the implementation efforts of EPA—relatively swift compliance with thermal pollution policy and protracted noncompliance with SO_2 policy—are compared and contrasted. The analysis is guided by two sets of research questions. One set seeks to assess the nature of the intragovernmental implementation process, as well as the implications of the EPA/TVA cases for emerging policy implementation theory. The second set of questions addresses the implications of intragovernmental policy implementation for the administrative state. The study both supports the importance of, and suggests refinements to, several factors found to condition implementation in other contexts. Those refined include policy/mission proximity, complexity of joint action, dispositions of actors, and validity of causal theory. What is more, the cases suggest that federal agencies

can be made distinctly vulnerable to public regulation; that intra-governmental policy implementation as a form of "bureaucratic oversight" is a promising supplement to traditional overhead democracy techniques; and that challenges raised by public agencies to implementation may not be as inappropriate and dysfunctional as commonly assumed.

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CHAPTER I

ANATOMY OF A POLICY IMPLEMENTATION DILEMMA

Norton Long in his assessment of the relationship between public bureaucracy and constitutionalism asserts that "the folklore of constitutional theory relegates the bureaucracy to somewhat the same low, but necessary estate as Plato does the appetitive element of the soul."[1] The critical role afforded bureaucracies in the implementation of such positive state initiatives as the New Deal, Fair Deal, and Great Society reflects the paradox described by Professor Long. Public agencies are increasingly expected to promote, provide, and even guarantee essential goods, services, and opportunities to the nation's citizenry. Yet public bureaucracies are also increasingly viewed with a wariness stimulated by normative and utilitarian concerns. The former are impelled by Weber's distressing scenario of a political master turned dilettante in the presence of an expert, unelected bureaucracy.[2] The latter are evoked by anxieties that bureaupathologies ascribed to private organizations might be the force majeur of public agencies as well, causing the displacement of policy goals by the parochial appetites of public managers.

This ambivalence toward bureaucracy has stimulated much scholarly interest in what Dodd and Schott term the "sublegislative process"—the

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[1]Norton E. Long, "Bureaucracy and Constitutionalism," American Political Science Review 46 (September 1952): 808.

[2]H. H. Gerth and C. Wright Mills, From Max Weber: Essays in Sociology (New York: Oxford University Press, 1946), passim.

process whereby law is distilled into administrative action.[3] One component of this interest has been the study of the implementation of public policy by administrative agencies. Most studying this topic have concentrated on national policies, focusing on the impediments to successful implementation posed by our system of administrative federalism. Such a focus was sufficient when efforts to effect national policies consisted primarily of federal agencies acting either indirectly through, or directly on state, local, and private sector actors. But of late a new impediment has arisen. With today's expansion of national government responsibilities, realizing policy goals ofttimes entails one federal agency acting directly on another federal agency. In the extreme this can involve one national bureaucracy being legally charged with changing or modifying the behavior of another that, in turn, is pursuing its own policy responsibilities.[4] As a consequence a burgeoning arena of bureaucratic politics emerges; one wherein conflicting, even mutually exclusive, policy mandates must be reconciled.

In describing the "bureaucracy problem" James Q. Wilson argues that "first there is the problem of . . . getting the bureaucracy to serve agreed on national goals."[5] When federal agencies must alter the

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[3]Lawrence C. Dodd and Richard L. Schott, Congress and the Administrative State (New York: John Wiley & Sons, 1979).

[4]James Q. Wilson and Patricia Rachal, "Can the Government Regulate Itself?," The Public Interest (March 1977): 3-14.

[5]James Q. Wilson, "The Bureaucracy Problem," The Public Interest (Winter 1967): 4.

behavior of sister agencies, however, a contest can arise over which national goal prevails, in what form, and in whose interest. Public agencies normally are reluctant to modify their goals and behavior at the behest of other agencies for fear of upsetting the delicately tuned equilibrium of their organization's political economy.[6]

Despite the increasing necessity of implementing national goals within the federal establishment, there is a paucity of systematic research dealing explicitly with the topic. This study proposes to refine our largely impressionistic understanding of this intragovernmental implementation process by examining one of its more notable manifestations: the implementation of pollution control policy as it applies to federal facilities. Its analytical focus is the Environmental Protection Agency's (EPA) experience with the Tennessee Valley Authority (TVA) during EPA's implementation of the Clean Air Act (CAA) and the Federal Water Pollution Control Act (FWPCA). Specifically examined are EPA's efforts to apply its sulfur dioxide (SO_2) and thermal pollution control policies to the power program operations of the TVA during the 1970's. Using a comparative case study design, the divergent responses of TVA to the implementation efforts of EPA—relatively swift compliance with the thermal pollution standards of the FWPCA, and protracted noncompliance with the SO_2 pollution standards of the CAA—are compared and contrasted.

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[6]Gary L. Wamsley and Mayer N. Zald, The Political Economy of Public Organizations: A Critique and Approach to the Study of Public Administration (Lexington: Lexington Books, 1973).

The analysis is guided by two sets of research questions. One set stems from an interest in implementation as a public policy problem and seeks to assess the implications of the EPA/TVA experiences for emerging policy implementation theory. Queried is the nature of the intragovernmental implementation process and how it compares with implementation in other contexts. What do the two cases suggest about what can happen, and why, when a federal agency is charged with holding a sister agency accountable to the law? Are factors said to condition implementation powerful in the intragovernmental arena as well? Do the two cases suggest refinements to, or amplifications of, emerging implementation theory?

The second set of questions deals specifically with the implications of intragovernmental policy implementation for the administrative state. The questions arise from the speculation of several scholars that federal agencies cannot realistically be charged with holding sister agencies accountable to the law. What do the two cases indicate about the ability of one federal bureaucracy to alter the behavior of another in order to effect public policy? What do they suggest about bureaucratic accountability in the administrative state? What implications can be drawn from them concerning the public interest?

A focus on the EPA/TVA cases appears promising for several reasons. First, they are especially good examples of one federal agency (EPA) having to hold another (TVA) accountable to the law. Secondly, they represent two very divergent responses to such efforts and thus permit a glimpse of factors that both expedite and complicate implementation in these situations. Thirdly, perhaps nowhere is intragovernmental

policy implementation more visible, nor more a problem, than in the environmental policy arena. Finally, by juxtaposing two cases involving the same organizations operating in roughly the same time period, the confounding effects normally encountered when comparing cases are substantially controlled.

This study seeks to fill gaps in several research traditions. While policy analysts have given much attention to implementation as a problem in intergovernmental relations, they have typically failed to study the process in an intragovernmental setting and have largely ignored the implementation of regulatory policy. Although public administrationists have examined intragovernmental agency interaction, they have concentrated predominantly on interagency conflict over resource or mission allocations and policy formulation. Rarely investigated has been the situation in which public agencies must implement policy within the bureaucracy itself. And those studying regulation have focused most often on public sector control of private sector behavior, excluding from analysis similar efforts to constrain public sector activities. In contrast, this study examines the implementation of regulatory policy; and it does so by treating it as a dilemma in intragovernmental bureaucratic relations. Moreover, it investigates the burgeoning necessity of applying social controls to public, rather than private, sector behavior.

The study differs from past research in several methodological respects as well. First, while researchers typically have chosen to analyze cases of implementation failure, this study examines

implementation success as well. Second, rather than studying a single case of implementation as is usually done, this analysis compares and contrasts two highly dissimilar cases. Finally, unlike most prior research in this area, this study relates its findings to those of its predecessors in order to refine and amplify the "conventional wisdom" associated with policy implementation.

The remainder of this chapter sets the stage for analysis. Following a review of the developments that have led to an alteration of the substance, organization, and context of policy implementation, a synopsis of the two implementation challenges facing the EPA in the Tennessee Valley is presented. Next, current perspectives on implementation are examined as the literature on the topic is reviewed. The chapter concludes with a discussion of the research design framing the analysis.

The Evolution of a Policy Implementation Dilemma

E. E. Schattschneider once observed that "some issues are organized into politics, while others are organized out."[7] Over the past two decades a substantial expansion of the kinds of issues "organized into" our national political agenda has occurred. Congress has passed legislation concerned with housing, medical care, employment, civil rights, the environment, and public health and safety. The zeal of such efforts is reflected in the growth of the federal bureaucracy. Between 1960

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[7]E. E. Schattschneider, The Semisovereign People (Hinsdale: The Dreyden Press, 1960), p. 69.

and 1976 alone, thirty-four agencies were created to implement the policy initiatives of the positive state.[8]

The merits of these disparate policies aside, as products of a fragmented legislative process their goals are not always harmonious. Where this occurs the policies of the agencies charged with their implementation are often incompatible as well. Typically, these policies conflict in such a way that, while incongruous, direct interagency confrontation is avoided. Thus the Department of Agriculture continues to implement policies to protect the tobacco industry at the same time that the Department of Health and Human Services pursues policies to deter tobacco consumption. In other instances the programs of one agency impinge on those of another to such a degree that incompatible activities cannot be ignored. For example, mass transit programs of the Department of Transportation can affect the ability of the Department of Labor to implement its CETA manpower training programs. If viewed as sufficiently serious, problems of this nature are sometimes resolved by interagency coordinating committees and, less frequently, by the intervention of the president or his emissaries. In the extreme, however, the success of a policy may depend directly upon one agency's ability to mandate a major change in the behavior of another. This ability becomes critical as agencies acquire responsibility for implementing the social policies of the positive state. And perhaps nowhere does this situation arise more

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[8]Charles Schultz, The Public Use of Private Interest (Washington, D.C.: The Brookings Institution, 1977).

boldly than in the administration of federal regulatory policy as it has evolved over the last two decades.

Charles Frankel has noted a "major shift in our civilization's center of gravity—the emergence of science, technology and bureaucracy as the great driving enterprises of modern society."[9] These three elements merge strikingly in the arena of contemporary federal regulatory policy. Historically, these policies focused essentially on economic objectives. Independent commissions were established to implement policies designed to prevent free-market inequities and abuses (anti-trust violations and price-fixing), to improve the quality and volume of services, and to promote commerce through grants and subsidies.[10] With few exceptions, agencies such as the Interstate Commerce Commission, the Federal Trade Commission, and the Federal Communications Commission were structured to oversee particular industries (e.g., railroads) rather than particular problem areas common to industry in general

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[9]Charles Frankel, The Democratic Prospect (New York: Harper & Row, 1962), p. 8.

[10]Several excellent treatments of traditional economic regulation are Paul MacAvoy, The Regulated Industries and the Economy (New York: W. W. Norton and Company, 1979) and The Crisis of the Regulatory Commissions (New York: W. W. Norton and Company, 1970); Robert E. Cushman, The Independent Regulatory Commissions (New York: Oxford University Press, 1941); Henry J. Friendly, The Federal Administrative Agencies (Cambridge: Harvard University Press, 1962); Louis M. Kohlmeier, Jr., The Regulators: Watchdog Agencies and the Public Interest (New York: Harper and Row, 1969); James E. Anderson, Emergence of the Modern Regulatory State (Washington, D.C.: Public Affairs Press, 1962); and David M. Welborn, Governance of Federal Regulatory Agencies (Knoxville: The University of Tennessee Press, 1977).

(e.g., occupational safety).[11] And each was "more or less mandated to protect as well as regulate" the industry under its jurisdiction.[12] The epitome of Downs' issue-attention cycle,[13] these agencies were portrayed by scholars as either "captured" by industry,[14] operating exclusively in their own self-interest,[15] or operating—as originally intended—to protect industry interests.[16]

In contrast, the policies collectively known as the "new social regulation" focus primarily on attaining noneconomic objectives through agencies structured to oversee particular problem areas (e.g., pollution control) rather than particular industries.[17] As such, they typically affect most aspects of a regulatory target's operations. Agencies such as the Occupational Safety and Health Administration, the Consumer Product Safety Commission, and the Environmental Protection Agency affect health, consumer protection, and environmental policies that transcend industry

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[11]Paul H. Weaver, "Regulation, Social Policy, and Class Conflict," The Public Interest (Winter 1978): 45-63.

[12]Ibid., p. 47.

[13]Anthony Downs, "Up and Down with Ecology—The Issue-Attention Cycle," The Public Interest (Summer 1972): 38-50.

[14]Samuel P. Huntington, "The Marasmus of the ICC: The Commission, the Railroads, and the Public Interest," Yale Law Journal 61 (April 1952): 467-509.

[15]James Q. Wilson, "The Dead Hand of Regulation," The Public Interest (Fall 1971): 39-58.

[16]Gabriel Kolko, Railroads and Regulation 1877-1916 (Princeton: Princeton University Press, 1965).

[17]William Lilly and Edward Miller, "The New Social Regulation," The Public Interest 47 (March 1977): 28-36.

boundaries and cut to the quick of organizational functions. Moreover, they are charged exclusively with controlling rather than promoting industry activities. Implementing agencies are presumably less vulnerable to agency capture as relationships are said to reflect adversarial rather than cooperative characteristics. Consequently, the "cozy triangle" is replaced by an alliance of the implementor, public interest groups, and the press.[18]

Just as the substance and organization of regulatory policy implementation have evolved, so too has its context. Most conspicuous in promoting this development is the changing service provision role assigned to the federal government by the positive state philosophy.[19] Richard B. Stewart suggests the contemporary commitment to this role when he asserts that "given the enormous expansion of governmental activity . . . the distinct spheres of private and governmental activity have melded."[20] Consequently, activities of federal agencies, either serendipitously or by specific legislative design, fall increasingly within the ambit of the implementation responsibilities of other

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[18]Weaver, "Regulation, Social Policy, and Class Conflict," 45-63.

[19]For an excellent summary of the effect of the positive state philosophy on the contemporary state see Kenneth J. Meier, Politics and the Bureaucracy: Policymaking in the Fourth Branch of Government (North Scituate: Duxbury Press, 1979) and Charles A. Reich, "The New Property," The Public Interest (Spring 1966): 57-89. Those portraying government as the ultimate provider and guarantor of essential services include, among others, Peter H. Schuck, "Litigation, Bargaining, and Regulation," Regulation 3 (July/August 1979): 26-39; and John H. Shenefield, "Government Enterprises—A New Frontier for Regulatory Reforms," Regulation 3 (November/December 1979): 16-18.

federal agencies. As a consequence, policy often must be effected in an intragovernmental context. In the extreme case of the new social regulation, this can involve one federal agency being legally charged with significantly changing the behavior of another.

But how, to what extent, and under what circumstances, can national policy be implemented in instances where one federal agency must hold another accountable to the law? John Schenefield suggests the magnitude of the problem:

> Precisely because a particular public authority is acting on behalf of a generalized public interest, it may cease to be subject to laws that frame the rest of the marketplace—laws on disclosure, antitrust, sometimes even health and safety. Service to the public interest at large leads to avoidance of public responsibility.[21]

Similarly, James Q. Wilson and Patricia Rachal ask, "Can government regulate itself?"[22] They conclude that the more a regulatory policy affects a target agency's mission or decision-making autonomy, the more likely that agency will resist the changes in its behavior the policy requires. They reason that because the behavior to be altered stems from a target agency's pursuit of its own policy responsibilities, it can be perceived antagonistic to the agency's ability to realize its mission or capable of alienating its clientele. A policy implementation dilemma consequently arises; one inimical to the best interest of the public. This occurs as the agency actively opposes the application of

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[21]Shenefield, "Government Enterprises," 18.

[22]Wilson and Rachal, "Can Government Regulate Itself?," 3-14.

regulatory policy to its operations, mobilizing—wherever and whenever possible—those who share its opposition to policy implementation.

The Policy Implementation Dilemma in the Tennessee Valley

The EPA/TVA pollution control experience provides an especially appropriate laboratory for studying the policy implementation dilemma. During the 1970's the EPA, as the federal agency responsible for implementing the Clean Air Act (CAA) and the Federal Water Pollution Control Act (FWPCA), and the TVA, as a federally owned corporation spawned during the New Deal to fashion economic development in the Tennessee Valley, collided over national environmental standards. Unlike prior federal pollution control statutes, the CAA and the FWPCA specifically authorized the Environmental Protection Agency to hold all federal facilities accountable to national air and water quality standards. These mandates were viewed necessary since the voluntary compliance record of federal facilities with past environmental legislation was regarded by some as a public embarrassment. According to Representative William L. Springer:

> One of the most frustrating aspects of . . . pollution legislation is the presence of large federal installations either operated directly by the government or under its direction which contaminate the atmosphere on a large scale. How can we expect cooperation or credibility [from private sources] . . . when the installations controlled by Uncle Sam are some of the worst polluters?[23]

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[23] 116 Congressional Record 19, 207 (1970).

There was perhaps no more visible, and critics would argue no less repentant, federal polluter than the Tennessee Valley Authority. Since its inception in 1933 the TVA had, through a cumulation of administrative decisions, evolved into the largest electrical power producer in the United States.[24] As power demands in the TVA service area expanded over the years, so too did TVA's mix of fuel sources for generating that power. The generating capacity of its heralded hydroelectric dam system was outstripped during and after World War II by an influx of industrial and government installations seeking low-cost electricity. The agency turned at that point to steam plants fired by the abundant, inexpensive coal reserves of its native Appalachia. As demand increased again during the late 1950's and early 1960's, TVA made a commitment to nuclear energy unprecedented in the utility industry. Beginning in 1965 and continuing during the early 1970's, TVA committed itself to placing on line seventeen nuclear generating units at seven nuclear plant sites.[25]

While intended to ameliorate its power generating woes, TVA's decisions to enter the coal and nuclear fuel cycles created a new

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[24]See Victor C. Hobday, Sparks at the Grass Roots (Knoxville: The University of Tennessee Press, 1969); Roscoe C. Martin, TVA: The First Twenty Years (Kingsport: The University of Tennessee Press and The University of Alabama Press, 1956); Lawrence L. Durisch and Robert E. Lowry, "The Scope and Content of Administrative Decision—The TVA Illustration," Public Administration Review 4 (Autumn 1953): 219-226; Charles M. Stephenson, "Administrative Decision Revisited: TVA Experience Since 1953" (unpublished paper, The Tennessee Valley Authority, Knoxville, 1975); North Callahan, The TVA: Bridge Over Troubled Waters (New York: A. S. Barnes and Company, 1980).

[25]Tennessee Valley Authority, Annual Report of the Tennessee Valley Authority: 1975 (Knoxville: TVA, 1975), pp. 47-48.

problem: how to best cope with the environmental problems caused by such technologies. In the case of coal, toxic sulfur dioxide (SO_2) is one of the inherent by-products of the coal combustion process.[26] Similarly, nuclear plants are distinctly noted, among other things, for the ecosystem damage they impose on the aquatic life of lakes and ponds providing water as a coolant for reactor cores.[27] As one would expect both pollutants had aroused sufficient alarm among environmentalists to stimulate specific legislative proscriptions, albeit ones premised on questionable knowledge, and untested institutional enforcement capacity.

Sulfur dioxide was one of the six air pollutants that EPA was required to control under the Clean Air Act of 1970.[28] Pursuant to this Act, the agency was to issue primary and secondary ambient air quality and emission standards for limiting SO_2 concentrations in the environment. Primary standards were to be set so as "to protect the public health" while "allowing an adequate margin of safety."[29] The more stringent secondary standards were designed to protect the public welfare (vegetation, wildlife, materials, etc.).[30] The primary standards for

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[26]Lettie McSpadden Wenner, One Environment under Law (Pacific Palisades: Goodyear Publishing Company, 1976), pp. 39-40. Thermal pollution is also a problem with coal steam plants, but because they do not generate anywhere near the amount of heat that nuclear plants do, it is typically a much less severe one.

[27]David Howard Davis, Energy Politics, 2d ed. (New York: Saint Martins Press, 1978), pp. 191-192.

[28]The Clean Air Act of 1970, Pub. L. No. 91-604. Henceforth cited as the CAA of 1970.

[29]CAA of 1970, Sect. 109. [30]Ibid.

SO_2 were originally to be met by May 31, 1975, and the secondary standards within a "reasonable" period of time.[31] These standards applied to stationary sources of SO_2 pollution such as TVA's coal-fired steam plants, with the standards of performance selected by EPA requiring "the application of the best system of emissions reduction . . . [that] the administrator determines has been adequately demonstrated."[32]

Similarly, thermal pollution control was one of EPA's responsibilities under the Federal Water Pollution Control Act.[33] Prior to the enactment of comprehensive amendments to that Act in 1972, EPA was responsible for approving state thermal standards, for imposing its own requirements should a state fail to act, and for enforcing these regulations should it so desire. With the enactment of the 1972 amendments, EPA had to establish nationally uniform, technology-based effluent limits for major sources of thermal pollution such as TVA's prospective nuclear plants. By 1977 the agency was to hold thermal dischargers accountable to standards premised on the application of the "best practicable control technology currently available (BPT) as determined by the administrator."[34] To do so it was to administer a permit system whereby pollution sources could be denied operating permits for failing to comply with thermal policies.

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[31] CAA of 1970, Sect. 110. [32] CAA of 1970, Sect. 111.

[33] The Federal Water Pollution Control Act of 1972, Pub. L. 92-500 (1972). Henceforth cited as the FWPCA of 1972. Prior to EPA's creation in late 1970, the Interior Department was the federal agency responsible for overseeing the development of these standards.

[34] FWPCA of 1972, Sect. 301.

The TVA's commitment to coal and nuclear technologies, and the EPA's statutory responsibility to control the SO_2 and thermal pollution spawned by these technologies, combined to place the two federal agencies on a collision course. Two major confrontations occurred during the 1970's. In the first, ten of TVA's twelve coal-fired steam plants were judged by EPA to be in violation of SO_2 emission limits promulgated under the CAA. In the second, EPA issued and sought to hold TVA accountable to thermal pollution standards at its nuclear plants that the latter felt were overly stringent. EPA's interpretation of each law required extremely costly technological and behavioral changes by the TVA;[35] changes that would both jeopardize TVA's leadership as a "yardstick" for low-cost energy production and severely encroach upon its traditional decision-making processes.

TVA's responses to EPA's implementation of each statute differed markedly. Within one year after EPA expressed its concern, TVA agreed to install cooling towers to comply with thermal pollution standards at its Brown's Ferry nuclear plant. This was done despite ongoing discussions with EPA over their necessity. Moreover, within two years this commitment to cooling towers was extended to all TVA nuclear plants, present and projected. Once again, however, this was done amidst continuing controversy over the appropriateness of their installation. In contrast, since mid-1972 prolonged, often rancorous interagency

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[35]The capital cost for meeting thermal standards was $640 million dollars. Capital costs for meeting SO_2 regulations totaled $760 million after the initial $1.02 billion settlement was revised by a federal district court judge in Nashville in December of 1980.

debate ensued over EPA's implementation of SO_2 emission standards as they apply to TVA coal-fired power plants. This debate continued until late 1978 when a consent agreement negotiated by the two agencies was approved by the TVA Board of Directors. The consent agreement was secured only after TVA's persistent arguments against implementation were taken to the EPA, the Congress, the federal judiciary, the states, and the public at large. In the end TVA yielded to the EPA implementation effort, but only after a determined, at times very nearly successful, campaign to resist it.

Why were EPA's experiences with TVA during the implementation of these two policies so different? Both policies required substantial monetary commitments and operational changes by the TVA if they were to be successfully applied to that agency. And both intruded substantially on TVA's decision-making autonomy. There is a growing body of implementation literature available which may provide some insight into this question.

Policy Implementation in Analytic Perspective: The Literature

While political scientists have increasingly turned to the study of public policy, particular aspects of that process have received more attention than others. Most scrutinized have been the socioeconomic determinants of policy, the processes of demand articulation and policy-making, and the impact of policy. Less examined, until recently, has been the policy implementation process. As broadly defined by Mazmanian

and Sabatier, implementation is "that which takes place between the formal enactment of a program by a legislative body (or, in some instances, a chief executive or the courts) and its intended and unintended impacts . . . ."[36] Other popular definitions of the concept include: "the interaction between the setting of goals and actions geared to achieve them";[37] the "ability to forge subsequent links in the causal chain so as to obtain the desired results";[38] the "moving from a decision to operations in such a way that what is put into place bears a resemblance to the decision . . . ."[39] Common to all, however, is an emphasis on the activities directed toward effecting public policy.

Heralded by the demise of the classic politics/administration dichotomy, and guided by a conventional wisdom that indicts bureau-pathologies as the disspoilers of national policy goals, a multi-disciplinary rush to understand the implementation process has occurred. Case studies of implementation have proliferated, most notably in the policy arenas of education, employment, urban planning, civil rights, and environmental quality. What is more, several researchers have developed conceptual frameworks for studying implementation by integrating the findings of these studies. With the apparent slippage between

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[36]Daniel Mazmanian and Paul Sabatier, "Symposium on Successful Policy Implementation," Policy Studies Journal 8 (1980): 531.

[37]Jeffrey L. Pressman and Aaron B. Wildavsky, Implementation (Berkeley: University of California Press, 1973), p. xv.

[38]Ibid.

[39]Walter Williams, "Special Issue on Implementation: Editor's Comments," Policy Analysis 1 (Summer 1975): 451.

"ambition and accomplishment, legislation and execution, promise and performance,"[40] it is now widely assumed that knowledge of the implementation process is critical to a full appreciation of contemporary political life.[41]

Those studying the implementation of policy by administrative agencies have typically focused on the obstacles posed to it by administrative federalism. Examined most frequently have been national distributive and redistributive policies that have met with implementation failure rather than success. Researchers often portray a policy as frustrated, wittingly or unwittingly, by the myriad of actors whose agreement is required to effect it.[42] According to Charles O. Jones, opportunities for implementation to go awry in this fashion occur during three analytically distinct sets of implementation activities. The first set, known as organization, deals with "the establishment of units and methods for putting a program into effect."[43] The second is concerned with the "translation of program language into acceptable and feasible

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[40]Mark H. Moore and Graham T. Allison, "Introduction," Public Policy (Spring 1978): 152.

[41]Kenneth M. Dolbeare and Philip E. Hammond, The School Prayer Decisions: From Court Policy to Local Practice (Chicago: University of Chicago Press, 1971).

[42]Pressman and Wildavsky, Implementation; Alfred A. Marcus, Promise and Performance: Choosing and Implementing an Environmental Policy (Westport: Greenwood Press, 1980); and Eugene Bardach, The Implementation Game (Cambridge: MIT Press, 1977).

[43]Charles O. Jones, An Introduction to the Study of Public Policy, 2d ed. (North Scituate: Duxbury Press, 1977), p. 134.

directives" and is known as interpretation.[44] The third is labeled application and summarizes those activities surrounding the "routine provision [or application] of . . . agreed upon program objectives."[45]

Implementation is most often described as a bargaining process.[46] Public agencies are said to negotiate rather than dictate national policy using services, subsidies, and punitive measures as implementation inducements to subnational actors. The response of these actors is conditioned by a rational pursuit of self-interest; they tend to comply most readily when the expected utilities of compliance outweigh the expected utilities of noncompliance.[47] What is more, if noncompliance is pursued, implementation becomes a circular bargaining process with all participants striving to affect policy in whatever forum (public or private) and at whatever stage of the policy process deemed appropriate.[48]

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[44]Ibid.

[45]Ibid.

[46]Helen Ingram, "Policy Implementation through Bargaining: The Case of Federal Grants-in-Aid," Public Policy 25 (Fall 1977): 499-526; Milbrey McLaughlin, Evaluation and Reform: ESEA, Title I (Cambridge: Ballinger, 1975); and Donald Van Meter and Carl Van Horn, "The Policy Implementation Process: A Conceptual Framework," Administration and Society 6 (February 1975): 445-488.

[47]Neal A. Milner, The Court and Local Law Enforcement: The Impact of Miranda (Beverly Hills: Sage Publications, 1971); and Harold Luft, "Benefit Cost Analysis and Public Policy Implementation," Public Policy 24 (Fall 1976): 437-462.

[48]Martin Rein and Francine F. Rabinovitz, "Implementation: A Theoretical Perspective," in American Politics and Public Policy, eds. Walter D. Burnham and Martha W. Weinberg (Cambridge: MIT Press, 1978), pp. 205-211; Paul Anderson, "Implementing Air Pollution Control Policy: The Sulfur Dioxide Emission Limitations Program in Ohio," in Energy and Environmental Issues: The Making and Implementation of Public Policy, ed. Michael Steinman (Lexington: Lexington Books, 1979), pp. 117-136; and Leonard Goodwin and Phyllis Moen, "The Evolution and Implementation of Family Welfare Policy," Policy Studies Journal 8 (1980): 633-651.

Researchers have also found that certain factors tend to condition implementation. For purposes of discussion, these can be divided into three analytically distinct categories: organizational, technoscience, and sociopolitical. These factors, and the manner in which each is said to affect implementation, follow.

Organizational Factors

Those studying implementation suggest that organizational characteristics are the richest source of factors conditioning policy implementation. Given the propensity of Congress to delegate authority to federal agencies, and the discretionary latitude public managers enjoy while carrying out policy, this is not surprising. Bureaucratic decision-making is indeed "the core of modern government."[49]

One factor found especially critical to implementation is the institutional mission of the agencies involved. The concept of institutional mission refers to an organization's dominant official philosophy or administrative ideology.[50] It is identifiable in an agency's technical programs, procedures, and decision premises,[51] and represents the "view held by the dominant group in the organization" about what its

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[49]Carl J. Friedrich, Constitutional Government and Politics (New York: Harper and Row, 1937), p. 124.

[50]Philip Selznick, Leadership in Administration (New York: Harper and Row, 1957), p. 14; W. Henry Lambright, Governing Science and Technology (New York: Oxford University Press, 1976), pp. 145-147.

[51]Ibid.

capabilities and ends should be.[52] Should implementing or target agency officials subscribe to a mission inconsistent with, alien to, or hostile toward a particular policy, long-term implementation delay is highly probable.[53] Since organizations tend to zealously protect their institutional missions from substantial alteration by external agency actors, policies perceived as affecting the ability of an agency to realize its mission can meet strong resistance. It is generally felt that a policy seriously affecting an agency's mission is significantly more difficult to implement than one that affects it only very little or not at all.

The complexity of joint action is a second factor found to be an especially powerful predictor of implementation success or failure.[54] The concept refers to the number of individuals, aside from implementors

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[52]Morton H. Halperin, Bureaucratic Politics and Foreign Policy (Washington, D.C.: The Brookings Institution, 1974), p. 28.

[53]Wilson and Rachal, "Can Government Regulate Itself?," 3-14; Beryl A. Radin, Implementation, Change, and the Federal Bureaucracy (New York: Teachers College Press, 1977); Jerome Murphy, State Education Agencies and Discretionary Funds (Lexington: Lexington Books, 1974); Morton H. Halperin, "Implementing Presidential Foreign Policy Decisions: Limitations and Resistance," in Cases in Public Policy-Making, ed. James E. Anderson (New York: Praeger Publishers, 1976), pp. 208-236; Richard Weatherly and Michael Lipsky, "Street Level Bureaucrats and Institutional Innovation: Implementing Special Education Reform," Harvard Educational Review 47 (May 1977): 171-197; and Rufus P. Browning, Dale Rogers Marshall, and David H. Tabb, "Implementation and Political Change: Sources of Local Variations in Federal Social Programs," Policy Studies Journal 8 (1980): 616-632.

[54]Pressman and Wildavsky, Implementation; Marcus, Promise and Performance; and Bardach, Implementation Game.

and target populations, whose agreement with a policy is necessary before it can be fully implemented. It is proposed that "the price of this ultimate agreement is delay" of implementation.[55] Delay is thus seen as a "function of the number of decision points, the number of participants at each point, and the intensity of their preferences."[56] The greater the number of decision points and participants, and the more negative their views toward a policy, the longer implementation delay.

A third factor associated with this category is the disposition of the actors involved in implementation. Two aspects of actor attitudes predominate. First, the attitudes of implementing or target agency officials toward the policy can be critical. Researchers suggest that the less positively disposed officials are, the more likely implementation will be lax or challenged, and the less likely it will be successful in the short term.[57] These attitudes usually are based on technical or legal grounds and deal with the feasibility of the policy on these dimensions. Secondly, the attitudes of implementors toward applying available enforcement resources can condition implementation. While statutes normally provide such resources, these vary in effectiveness.

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[55]Pressman and Wildavsky, Implementation, p. 116.

[56]Ibid., p. 118.

[57]Martha Derthick, New Towns In-Town (Washington, D.C.: Urban Institute, 1972); Rufus P. Browning and Dale Rogers Marshall, "Implementation of Model Cities and Revenue Sharing in Ten Bay Area Cities: Design and First Findings," in Public Policy Making in a Federal System, eds. Charles O. Jones and Robert D. Thomas (Beverly Hills: Sage Publications, 1976), pp. 191-216; and David H. Tabb, "Implementation and Political Change: Sources of Local Variations in Federal Social Programs," Policy Studies Journal 8 (1980): 616-632.

Tax credits or fines may prove insufficient, threatened funding cut-offs may lack credibility, and agency staffing may be inadequate to apply sanctions no matter how promising they might be. Should implementation targets perceive these resources weak, or implementors reluctant or unable to apply them, implementation delay is extremely likely.[58]

The manner in which policy is communicated is a fourth organizational factor said to condition implementation. It is useful to think of implementation as a two-step communication process. First, Congress must adequately express its intentions to implementing agencies. The clarity of statutory language is critical in this regard. Second, implementors must communicate their interpretations of the statute to target populations. They do this by promulgating administrative rules and regulations. Problems capable of disrupting implementation can arise during each of these steps. The necessity for coalition building during the legislative process, the complexity of contemporary problems, the tendency for legislators to avoid politically unpopular decisions, and the proclivity to use legislation for symbolic effect, all militate against unambiguous statutory language. In the process they can also undermine the clarity and consistency of rules promulgated by implementing

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[58] Jones, Introduction to Study of Public Policy, Chap. 7; Bruce P. Ball, "Water Pollution and Compliance Decision Making," in Public Policy Making in a Federal System, eds. Charles O. Jones and Robert D. Thomas (Beverly Hills: Sage Publications, 1976), pp. 169-187; and Matthew Holden, Jr., "Political Bargaining and Pollution Control," in Politics and Economic Policy-Making, ed. James E. Anderson (Reading: Addison-Wesley Publishing Company, 1970), pp. 433-452.

officials. The more ambiguous the language of a statute, the more susceptible to opposing interpretations it becomes, and consequently, the more likely it will be challenged during implementation.[59] Similarly, should rules become confusing, logically inconsistent, or perceived as vacillating, inordinate implementation delay becomes likely as well.[60]

The final organizational factor is the degree to which those involved in implementation anticipate future interaction. Obviously, the necessity for continuing involvement varies as to frequency and variety of contacts. Interaction can be episodic or recurring, limited to one issue or applicable to many. Researchers suggest that implementation is facilitated if actors foresee continuing contacts over a range of topics.[61] Under such circumstances, participants tend to assume more conciliatory, less uncompromising implementation attitudes. These attitudes are attributed to the anxiousness of all concerned to expedite future contacts dealing with the same policy, and to their desire to prevent animosities from coloring interaction on other matters.

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[59]George C. Edwards III and Ira Sharkansky, The Policy Predicament: Making and Implementing Public Policy (San Francisco: W. H. Freeman and Company, 1978), Chapter X; Paul A. Sabatier, "Regulatory Policy-Making: Toward a Framework of Analysis," Natural Resources Journal 17 (July 1977): 415-460.

[60]Robert T. Nakamura and Frank Smallwood, The Politics of Policy Implementation (New York: Saint Martins Press, 1980); and Nelson Rosenbaum, "Statutory Structure and Policy Implementation: The Case of Wetlands Regulation," Policy Studies Journal 8 (1980): 575-596.

[61]Holden, "Political Bargaining and Pollution Control," pp. 433-452; and Ball, "Water Pollution and Compliance Decision Making," pp. 169-187.

Technoscience Factors

Technoscience—a hybrid concept adapted from the writings of Dwight Waldo—is a convenient shorthand term for referring to the scientific and technical factors said to condition implementation.[62] While policy is increasingly premised on social and natural science theory, the quality of these theories varies. Indeed, many are widely challenged by members of the scientific community. The Economic Opportunity Act, for example, was repeatedly challenged for relying on the theoretical assumption that poverty was partially attributable to feelings of personal inefficacy and could thus be "treated" by increasing the political participation of low-income citizens. And the FDA's ban on saccharine has been excoriated for relying on the theory that there is no acceptable ingestion threshold for the substance. Similarly, disagreement over appropriate "technologies" or "techniques" for realizing policy goals can arise among professionals concerned with such questions. Social workers, for example, may disagree in their approaches to improving a client's feelings of personal dignity, some counseling direct provision of services and others income transfers. Or the question of aerial versus ground spraying of insecticides, as recently occurred in California with regard to the medfly, can seriously split health professionals.

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[62]See Dwight Waldo, "Reflections on Technoscience Policy and Administration in a Turbulent Mileau," a paper presented at the Conference on Public Science and Administration at the University of New Mexico, Albuquerque, September 1969.

Prior research suggests that the more controversial the theory underlying a policy, the more likely will challenges to implementation occur, and the more difficult will that policy be to implement in the short-term.[63] Disagreement provides the potential for marshalling credible evidence against the appropriateness of a policy, and for a display of implementor uncertainty and timidity about applying it to implementation targets. Similarly, should professionals in general disagree over technique, or should professionals specifically charged with implementation publicly disagree, implementation delay is likely.[64] Again, disagreement becomes a bargaining resource to those opposed to a policy.

Sociopolitical Factors

Researchers aver that changing social and economic conditions, and the shifts in public attitudes and political agendas they engender, play a critical role in conditioning implementation. Public administrationists have long recognized that agencies do not operate in a political vacuum. There exists a constellation of actors operating in the "policy space"

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[63]Giandomenico Majone, "Process and Outcome in Regulatory Decision-Making," American Behavioral Scientist 22 (May/June 1979): 561-683; Paul Sabatier and Daniel Mazmanian, "The Implementation of Public Policy: A Framework of Analysis," Policy Studies Journal 8 (1980): 538-560; Stephen Zwerling, Mass Transit and the Politics of Technology: A Study of BART and the San Francisco Bay Area (New York: Praeger, 1974); and Richard J. Tobin, The Social Gamble (Lexington: Lexington Books, 1979).

[64]George C. Edwards III, Implementing Public Policy (Washington, D.C.: Congressional Quarterly, Inc., 1980); and John Whitaker, Striking a Balance (Washington, D.C.: American Enterprise Institute, 1976).

of an agency that can affect its behavior.[65] One influential component of this extra-organizational environment is the constellation of actors that comprise its subsystem.[66] This system consists of agency officials, clientele groups of the agency, and key members of congressional committees charged with overseeing agency activities. A second significant component consists of actors whose interest in agency behavior is episodic, limited solely to those decisions that periodically impinge on their activities or fall under the rubric of their institutional responsibilities in a democratic society.

The existence of these two components suggests that agency behavior can be influenced by a myriad of political actors drawn from all levels of the system; and all are capable of influencing implementation as well. These include elected executive and legislative officials, judges, political parties, the mass media, and interest groups. Those uncomfortable with a policy attempt to mobilize those elements in the environment of implementing agencies who share a stake, material or ideological, in reformulating policy through executive, legislative, or judicial channels.[67] The same strategy is pursued by implementors confronted by an uncooperative target population. Attempts are made to

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[65]Anthony Downs, Inside Bureaucracy (Boston: Little, Brown and Company, 1967).

[66]J. Leiper Freeman, The Political Process, 2d ed. (New York: Random House, 1965); Emmette S. Redford, Democracy in the Administrative State (New York: Oxford University Press, 1969); and Douglas Cater, Power in Washington (New York: Random House, 1964).

[67]Wilson and Rachal, "Can Government Regulate Itself?," 3-14; Bardach, Implementation Game; and Rein and Rabinovitz, "Implementation: A Theoretical Perspective," pp. 205-211.

fashion an atmosphere more conducive to implementation through mobilization of political allies wherever they may be found and in whatever forum available. Consequently, each participant will consider the constituency mobilization potential of itself and its counterpart in deciding courses of action during implementation.

Researchers also suggest that the more incongruous the policy is with present socioeconomic conditions and needs, the more incongruous will it be with the priorities of the political agenda. While legislation is the product of conditions at a single point in time, implementation must occur over time. It is thus especially vulnerable to changing public attitudes and shifting political agendas inspired by altered socioeconomic fortunes. The more incongruous a policy is with the current political agenda, the more difficult it will be to implement since political allies willing to challenge implementation will be more abundant for mobilization.[68] Consequently, the more likely implementation will suffer significant delay.

Collectively, these three classifications of factors are suggestive of what might be expected in the intragovernmental implementation arena. Together with Charles O. Jones' three sets of implementation activities, they play a central role in the research design of this study.

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[68]Van Meter and Van Horn, "The Policy Implementation Process," 445-448; John Quarles, Cleaning Up America (Boston: Houghton Mifflin, 1976); and Sabatier, "Regulatory Policy-Making," 415-460.

Research Design

As noted previously, the purpose of this study is two-fold. First, it seeks to explore the nature of the intragovernmental implementation process, compare it with implementation in other contexts, and assess its implications for emerging policy implementation theory. Second, it proposes to ascertain the implications of intragovernmental policy implementation for the administrative state. The analytical technique chosen to accomplish these tasks is the comparative case study. Given the lack of empirical research on policy implementation in the intragovernmental arena, the case study's most telling advantage over other designs—in-depth investigation—promises observations and inferences currently unavailable elsewhere.

Substantively, this study is a comparative case analysis of two instances of environmental policy implementation. Both involve the efforts of EPA to hold TVA accountable to policies the latter felt inappropriate. What is significant is that while both cases involved significant EPA intrusions on TVA's decision-making process, and both involved several hundred million dollars in expenditures, TVA responded differently to the two implementation efforts. The agency complied almost immediately with the FWCPA, while it engaged in prolonged, openly confrontational noncompliance with the CAA. The two EPA implementation efforts, as well as the divergent responses of TVA to them, are compared and contrasted.

To frame the analysis of the two cases, the study is organized around the three analytically distinct sets of activities reputed by

Charles O. Jones to be most significant to the implementation process: organization, interpretation, and application. Jones' categorization scheme appears promising since it is sufficiently focused to direct attention to particular implementation activities typically viewed as critical to the process. At the same time it is sufficiently broad so as not to preclude consideration of previously unidentified factors. Moreover, using Jones' scheme provides an in-depth analysis of what can happen as laws emanate from Congress, are interpreted by implementing federal bureaucracies, and are applied to particular situations.

The analysis begins with a description of the organizational structure of implementation provided by the Clean Air Act and the Federal Water Pollution Control Act (Chapter II). Such aspects as the statutory role of EPA and the states and the enforcement scheme provided by each statute are compared and contrasted. This is followed by an examination of EPA's evolving interpretation of the respective statutes. Recounted are the fundamental decisions EPA had to make about congressional intent before it could apply the two laws specifically to TVA (Chapter III). The process and substance of the decisions rendered by EPA are compared and contrasted, as is TVA's situation relative to EPA's interpretation. Next, the application phase of EPA's implementation of the two acts is analyzed (Chapter IV). This segment addresses the principle questions which had to be resolved prior to the resolution of each case, the actions taken by each agency as the questions were addressed, and the manner in which they were eventually resolved. Differences between the cases are again noted.

The data used to inform the inquiry are the product of two investigative techniques. To chronicle the course of events, documentation provided by actors involved in each case was extensively searched. Those providing materials included representatives of EPA, TVA, citizen groups, and state pollution control agencies. Analyzed were internal agency memoranda, interagency communications, and citizen group files and correspondence dealing with the two cases. Additional sources consulted included newspaper, periodical, and legal journal accounts of both the cases involved and the field of environmental policy in general. Extensive use was also made of relevant congressional hearing documents, Congressional Quarterly Almanacs and Weekly Reports, and Government Accounting Office studies. These were essential for compiling background information on the legislative history and evolution of the Clean Air Act and the Federal Water Pollution Control Act.

Because those studying implementation suggest that the attitudes and perceptions of actors involved are critical to that process, the second data gathering technique consisted of semistructured interviews with twenty-two such individuals. Those interviewed included: past and present members of TVA's Board of Directors, Office of General Counsel, and Environmental Affairs Division; representatives of the EPA at both the Washington and Region IV (Atlanta) levels; representatives of citizen groups including the Tennessee Environmental Council and the League of Women Voters; and state government officials including legislators and air pollution control board members. Interviews were conducted in two stages. Preliminary background interviews were conducted from July 1979

to February 1980. Interviews dealing with the specifics of each case followed from June 1980 through May 1981.

With the stage now set for analysis, an examination of the organizational structure of implementation provided by the Clean Air Act and the Federal Water Pollution Control Act is provided in Chapter II. The evolution of the acts, as well as a description of their substance, is presented. The chapter concludes with a comparison of the implementation features of each.

CHAPTER II

ORGANIZING FOR POLLUTION CONTROL: THE EVOLVING FEDERAL DESIGN

Political philosopher James Harrington once wrote that "the law is but words and paper without the hands and swords of men."[1] Certainly in contemporary America the sword brandished tends increasingly to be the authority of the national government. And to the distress of many, those wielding the sword are typically the unelected public managers of the administrative state. Yet there is sufficient evidence to suggest that the power of elected officials to condition the policy swath ultimately cut is hardly insignificant.[2] One factor found most telling is the statutory language Congress provides when specifying units and methods for effecting policy.[3] Such specification, referred to by Charles O. Jones as the organization activities of implementation, is regarded by many as a key factor conditioning policy success or failure.

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[1]James Harrington, "The Commonwealth of Oceana," in Dictionary of Quotations, ed. Bergen Evans (New York: Avenel Books, 1978), p. 378.

[2]See Harold Seidman, Politics, Position, and Power, 2d ed. (New York: Oxford University Press, 1975); Theodore J. Lowi, The End of Liberalism (New York: N. W. Norton and Company, 1969); and Ronald Randall, "Presidential Power versus Bureaucratic Intransigence: The Influence of the Nixon Administration on Welfare Policy," American Political Science Review 73 (September 1979): 795-810.

[3]Seidman, Politics, Position, and Power; Sabatier and Mazmanian, "Implementation of Public Policy," 538-560; and Lowi, End of Liberalism.

In this chapter organizational aspects of the CAA and FWPCA operative as EPA sought to interpret and apply its SO_2 and thermal pollution policies to TVA are described, compared, and contrasted. The purpose of the analysis is to identify organizational differences between the two acts that EPA would have to contend with as it performed such interpretation and application tasks. After a review of the history, logic, and substance of the implementation design provided by each act, differences between the organizational infrastructure for interpreting and applying SO_2 and thermal pollution policy are noted.

Toward Pollution Control in the 1970's

The focus of this study is the EPA's experience with TVA during the former's implementation of the Clean Air Act and the Federal Water Pollution Control Act. To be specifically examined are EPA's efforts to apply its SO_2 and thermal pollution control policies to the power program operations of the TVA during the 1970's. The manner in which EPA was to pursue these objectives was specifically defined by the Congress in each act. This specification of units and methods for effecting policy, as well as the differences extant between the acts, are best appreciated by examining the evolution of their respective implementation designs.

It is usually wise to counsel, as V. O. Key did, against expecting public opinion to "emerge like a cyclone and push obstacles before it."[4]

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[4]V. O. Key, Jr., Public Opinion and American Democracy (New York: Knopf, Inc., 1961), p. 14.

Yet most agree that public opinion did just that during the problem identification and program formulation stages of recent environmental policy-making.[5] In the wake of the sinking of the oil tanker Torrey Canyon, the Santa Barbara oil spill, and virulent Nader group studies impugning the integrity of the congressional pollution control commitment, public concern over environmental degradation spiraled during the late sixties and early seventies.[6] What Etzioni and Wildavsky term "demonstration democracy" was the order of the day, featuring teach-ins, marches, and Malthusian prophecies. And terms such as "ecology," the "biosphere," and the "Greening of America" were the catchwords and phrases of the times. Against this leitmotif, environmental issues came to dominate the national political agenda, with the legislative and executive branches rushing pell-mell to quench the public's thirst for government redress. Major components of this effort came bottled in extensive revisions of the Clean Air Act and the Federal Water Pollution Control Act. And these, in turn, significantly affected the interpretation and application of sulfur dioxide and thermal pollution policies in the 1970's.

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[5]See Charles O. Jones, Clean Air (Pittsburg: University of Pittsburg Press, 1975); Quarles, Cleaning Up America; and Wenner, One Environment Under Law.

[6]The most significant of these studies were John Esposito, Vanishing Air (New York: Grossman Publishers, 1970), and David Zwick and Marcy Benstock, Water Wasteland (New York: Grossman Publishers, 1971).

The Clean Air Act

Since the enactment of the Clean Air Act in 1955[7] the federal government's authority to control stationary source air pollution had expanded significantly. Pre-1970 amendments to the CAA had graudally expanded federal responsibility beyond merely financing state and local air pollution control programs and research as provided in the original statute. In 1963, the federal government assumed responsibility for designing abatement procedures for resolving pollution problems in a limited number of circumstances.[8] Then in 1967, Congress mandated the establishment of federal ambient air quality criteria to serve as the basis for state-issued pollution emission standards.[9] These standards were applicable to pollution sources located in federally designated air quality control regions. This evolving nationalization of pollution control policy formulation and enforcement continued apace with the enactment in 1970 of major revisions to the Clean Air Act.[10] It is generally conceded that the CAA of 1970—amendments defining the organizational context of the EPA/TVA SO_2 dispute—made the federal government the "dominant presence in air pollution control."[11]

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[7]The Air Pollution Control Act of 1955, Pub. L. No. 84-159 (1955). While originally titled the Air Pollution Control Act, the act is popularly known as the Clean Air Act.

[8]The Clean Air Act of 1963, Pub. L. No. 88-206 (1963).

[9]The Air Quality Act of 1967, Pub. L. No. 90-148 (1967). Despite its different title, this act actually constituted amendments to the Clean Air Act.

[10]Clean Air Amendments of 1970, Pub. L. No. 91-604 (1970).

[11]David P. Currie, "Federal Air Quality Standards and Their Implementation," American Bar Foundation Research Journal 2 (1976): 365.

The 1970 amendments were primarily the product of deep and abiding disaffection with the implementation of the Air Quality Act of 1967. Critics persistently excoriated the Act as "ponderous," "disastrous," and "a goddamn mishmash."[12] Most distressing to critics was the seemingly lethargic response of both federal and state agencies to the Act's procedural requirements. For example, the sinew of the 1967 Act was specification by the Department of Health, Education, and Welfare (HEW) of both air quality control regions and quantitative criteria for hazardous pollutants. This was to be accompanied by state promulgation of criteria-based emission standards and implementation plans. Yet nearly two years after the law was passed, the surgeon general reported to the House Subcommittee on Public Health and Welfare that but twenty of an anticipated three hundred air quality regions were established; that criteria for only sulfur dioxides and particulates had been formalized; and that the states were just beginning to set emission standards.[13] Most telling, perhaps, was that no state implementation plan had received federal approval at that time. Most attributed these administrative delays to what Lowi terms "policy without law": the Act had failed to sufficiently specify clear goals and explicit procedures for implementation.[14]

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[12]Charles O. Jones, "Speculative Augmentation in Federal Air Pollution Policy-Making," in Cases in Public Policy-Making, ed. James E. Anderson (New York: Praeger Publishers, 1976), p. 62.

[13]U.S. Congress, House, Subcommittee on Public Health and Welfare, Committee on Interstate and Foreign Commerce, Hearings on Air Pollution Control and Solid Waste Recycling, 91st Cong., 1st and 2nd sess., 1969, 1970, p. 247.

[14]Lowi, End of Liberalism, p. 126.

Nettled by criticism, with the ecology issue at the apex of its issue-attention cycle, and with presidential aspirant Edmund Muskie stung by attacks on his leadership as chairman of the Senate Public Works Subcommittee on Air and Water Pollution, Congress sought to project a "tough posture" and "stern response" in the CAA of 1970.[15] The objectives of this Act were consonant with the thrust of prior air quality goals. Sought were the prevention of the deterioration of already clean ambient air, the creation of sufficiently clean air to protect the public health and welfare, and the prevention of "adverse . . . [air quality] . . . effects on any environmental, man-made or aesthetic process."[16]

The Act parted company with its predecessors, however, in its determination to constrain the substantive and procedural discretion of administrators implementing these ambitious goals. Critical to this effort was the precedent-setting stipulation of nationally-determined, health-based ambient air quality standards (NAAQS) for six air pollutants, and the setting of specific timetables for completion of federal and state agency implementation responsibilities. Under the terms of the Act, sulfur dioxide was one of the six pollutants scheduled for control. The procedures and timetables for implementation stipulated by the CAA provided that within thirty days of the enactment of the law, EPA was to release information documenting air pollutants that in the agency's

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[15]Marcus, Promise and Performance, p. 70.

[16]Walter A. Rosenbaum, The Politics of Environmental Concern (New York: Praeger Publishers, 1977), p. 144.

"judgment [had] an adverse effect on public health and welfare."[17] Known as air quality criteria, this documentation was to reflect "the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant (e.g., sulfur dioxide) in the ambient air, in varying quantities."[18] These criteria were to be the basis for prescribing national primary and secondary ambient air quality standards (NAAQS) for each pollutant. The NAAQS were also scheduled for promulgation during the same thirty-day period.

All ambient standards were to be developed solely on the basis of health considerations without concern for the economic or technological feasibility of their implementation. Within ninety days of their publication, during which time opportunity for written comment on their merits was to be provided, the NAAQS were to be published by the EPA administrator in the Federal Register. Within nine months of the formal promulgation of these standards, each state was to develop, after "reasonable notice and formal hearings," a plan for their "implementation, maintenance, and enforcement."[19] Referred to as State Implementation Plans (SIP's), these documents were to be submitted to EPA officials who were to "approve or disapprove such plan or any portion thereof" within four months after the deadline for SIP submissions.[20]

Rules for judging these plans as they applied to each air quality region (or part thereof) within each state were painstakingly detailed.

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[17] CAA of 1970, Sect. 108.

[18] Ibid.

[19] CAA of 1970, Sect. 110.

[20] Ibid.

In contrast to the solely health-based ambient air standards, SIP requirements could be based on economic and technological feasibility considerations as well. In addition, each SIP had to include appropriate attainment deadlines for states to meet the ambient standards; emission limits and compliance schedules for polluters to meet primary and secondary standards; procedures necessary to monitor, compile, and analyze data on air quality; provisions for intergovernmental cooperation; procedures for revising the SIP to accommodate changes in the ambient air standards; and assurances that sufficient state personnel, funding, and authority would be forthcoming.[21]

To dissuade ineffective implementation of the law by state and local administrators, Congress authorized the EPA to assume responsibility for both SIP preparation and enforcement in certain circumstances. Regarding SIP preparation, should a state fail to submit a plan for approval (as was common under the Air Quality Act) or should the plan, or parts thereof, be inadequate, the administrator could impose either a complete or partial plan for that state.[22] Moreover, absent effective state enforcement efforts, Section 113 became operative. Under this proviso, when any person was violating SIP emission standards EPA could directly notify both the violator and the state involved. Should noncompliance extend beyond thirty days of this notification, EPA could either issue a compliance order or seek a civil injunction to stop the violation.[23] Moreover, if the administrator attributed protracted

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[21] Ibid.

[22] Ibid.

[23] CAA of 1970, Sect. 113.

noncompliance to the misfeasance, malfeasance, or nonfeasance of state implementors, EPA was authorized to commence a "period of federally assumed enforcement" of the entire plan.[24] Penalties during this enforcement period subjected convicted violators to both civil penalties, including temporary or permanent injunctions, as well as criminal penalties for prolonged noncompliance.[25]

As a final bulwark against state and federal recalcitrance, the Act formalized the concept of "private attorneys general" acting as environmental custodians overseeing policy implementation. The innovative and ambitious Section 304 allowed standing to sue to any person who, on his own behalf, sought civil action against any person (the United States and any other government agency included) allegedly violating the CAA, or any state or federal enforcement order.[26] What is more, citizens could sue to compel the EPA to perform any nondiscretionary CAA procedure or duty previously unperformed. Procedurally, those contemplating court action had to notify both EPA and state authorities sixty days prior to filing suit, thus allowing officials opportunity to take appropriate enforcement action. The combination of statutorily-based, justiciable procedural deadlines, and the

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[24] Ibid.

[25] Ibid.

[26] CAA of 1970, Sect. 304. For excellent discussions of the background and meaning of Section 304 see Richard B. Stewart and James E. Krier, Environmental Law and Policy, 2d ed. (New York: Bobbs-Merrill, 1978), pp. 642-643; John E. Settle, Jr., "Guarding the Guardian: The 'Citizen Suit' for Clean Air," Environmental Law 3 (Spring 1973): 1-21; and Currie, "Federal Air Quality Standards," 400-402.

provision of legal standing for private citizens to enforce these deadlines, provided a mechanism for "guarding the guardians" of air pollution policy.

To summarize, sulfur dioxide was designated as one of six air pollutants to be regulated by the newly created Environmental Protection Agency (EPA) under authority of the Clean Air Act of 1970. Given the legacy of lethargic state and federal agency enforcement of previous legislation, Congress sought to limit the discretion of those responsible for controlling such pollutants. To do so, it provided an implementation framework for the CAA that provided specific procedures, decision-premises, and schedules that would be legally enforceable. It was within these organizational parameters that EPA would have to work in order to apply its sulfur dioxide policies to the Tennessee Valley Authority. As envisioned by the legislators, the promotion of air quality sufficient to protect the public health and welfare from SO_2 pollution would be realized through the promulgation of nationally-determined ambient air quality standards (NAAQS). These were to be premised solely on public health criteria, excluding consideration of the economic and technological feasibility of the resulting standards. The states were subsequently responsible for developing and enforcing State Implementation Plans (SIP's) to assure the attainment of the NAAQS by statutory deadlines. The EPA retained authority to revise any SIP, in whole or in part; to directly enforce any provision of a SIP; and to formally assume periods of federal enforcement of the entire plan absent sufficient state implementation effort. Short of appropriate implementation of the Act

by federal or state authorities, private citizens could go to court to enforce its provisions.

The Federal Water Pollution Control Act

The evolution of federal participation in water quality control efforts is highly reminiscent of trends in air quality control. History again documents a "story of increasing federal assumption of authority," a trend nurtured predominantly by the inability, and sometimes the reluctance, of state officials to pursue activist pollution control policies.[27] Congress first attempted to deal comprehensively with water pollution in 1948 with the enactment of the original Federal Water Pollution Control Act.[28] Concerned primarily with the discharge of effluents into interstate waterways, the Act authorized federal research and technical assistance programs, loans to states and localities for constructing waste treatment plants, and the establishment of cooperative state/federal water-basin pollution control programs. The federal role was limited to notifying polluters and state authorities about pollution problems, recommending that states initiate court action against polluters, and holding public hearings to stimulate state enforcement. Thus, as with the CAA of 1955, Congress made clear that water quality control was a prerogative of the states; the federal role was to be advisory at best.[29] The Act, however, proved to be a major disappointment.

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[27] Wenner, One Environment under Law, p. 71.

[28] The Federal Water Pollution Control Act of 1948, Pub. L. No. 80-845 (1948).

[29] Joseph T. Bockrath, Environmental Law for Engineers, Scientists, and Managers (New York: McGraw-Hill, 1977), p. 205.

Indeed, general enforcement provisions proved so cumbersome and unworkable that funds for federal activities associated with its implementation were once denied by the House Appropriations Committee on the grounds that the Act was "almost unenforceable."[30]

Subsequent amendments to the FWPCA made prior to 1970 sought to redress problems of inadequate federal authority, laggard state efforts, and time-consuming procedures. Amendments enacted in 1956 provided a conference-public hearing-court decree enforcement process.[31] These were followed in 1961 by revisions that extended federal enforcement jurisdiction to interstate waters and eliminated an earlier proviso that state consent was necessary before court abatement proceedings could be initiated by federal authorities.[32] The 1965 amendments followed, creating the Federal Water Pollution Control Administration within the Interior Department to assume implementation responsibility for the Act. They required as well that the states—subject to federal approval—classify by intended use (e.g., swimming, fishing, waste disposal) all water within their boundaries; adopt ambient water quality standards appropriate for these uses by 1967; and then develop implementation plans to achieve these standards. Absent the setting of state

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[30]J. Clarence Davies III and Barbara S. Davies, The Politics of Polution, 2d ed. (Indianapolis: Bobbs-Merrill Company, Inc., 1975), p. 29.

[31]The Federal Water Pollution Control Act Amendments of 1956, Pub. L. No. 84-660 (1956).

[32]The Federal Water Pollution Control Act of 1961, Pub. L. No. 87-88 (1961).

standards by the 1967 deadline, federally imposed standards could be promulgated in their stead by convening a standard-setting conference in the recalcitrant state.[33] While direct enforcement of the standards by the Interior Department was allowed, no civil suit could be initiated without the consent of the governor of the state whose standards were being violated.

Despite such legislative refinements, the enforcement performance of pre-1970 federal water quality programs was uninspiring. Indeed, in assessing these efforts Arbuckle and Vanderver concluded that "it was not until 1970 that industrial dischargers were faced with any real threat of prosecution."[34] The most pressing enforcement problem was federal reluctance to assert the authority it had been given. Critics were distressed that despite the 1967 deadline for submission of state water quality standards imposed by the 1965 amendments, many states failed to comply with the deadline—with apparent impunity. During the 1965 to 1969 period, only one federal standard-setting conference had been convened to promulgate federal standards when states failed to do so.[35] In the ecology-conscious, crisis-ridden atmosphere of the late sixties, demands for changes in water quality policy mounted.

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[33] The Water Quality Act of 1965, Pub. L. No. 89-234 (1965). Despite its different title, this act constituted amendments to the FWPCA.

[34] J. Gordon Arbuckle and Timothy A. Vanderver, Jr., "Water Pollution Control," in Environmental Law Handbook, ed. J. Gordon Arbuckle et al. (New York: Government Institutes, Inc., 1978), p. 95.

[35] Wenner, One Environment under Law, p. 85.

Since revision of the Clean Air Act dominated the agenda of Muskie's Subcommittee on Air and Water Pollution at this time, only piecemeal legislative changes could be forged immediately. Most significant for the EPA/TVA controversy was a provision in the Water Quality Improvement Act of 1970. Section 21(b) specified that applicants seeking federal licenses or permits to build or operate facilities that might pollute navigable waterways were to obtain state certification that water quality standards would not be violated by emissions from such a facility.[36] This provision was applicable to a variety of federal permit applications, including Atomic Energy Commission (now the Nuclear Regulatory Commission) permits for constructing and licensing nuclear power plants. Federal facilities such as TVA, however, would not have to get state certification. Instead, the Interior Department (later EPA) was charged with assuring that these agencies complied with all state water quality standards. A history of executive orders mandating federal facility compliance with water quality laws would presumably aid EPA in this chore.[37] In all other respects, however, the implementation framework provided by the FWPCA as amended through 1965 remained intact.

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[36]Section 216(b) of the Water Quality Improvement Act of 1970, Pub. L. No. 91-224 (1970). This provision was intended to prevent federal government preemption of water quality control. It was also Senator Muskie's intention to end a situation in which no agency had jurisdiction to prevent prospective thermal pollution. See Davies and Davies, Politics of Pollution, pp. 36-39, for a more detailed discussion of Muskie's travails.

[37]For example, Executive Order 11258, Prevention, Control and Abatement of Water Pollution by Federal Activities, November 17, 1965, and Executive Order 11288, Prevention, Control and Abatement of Water Pollution by Federal Activities, July 2, 1966.

Without the possibility of immediate, comprehensive congressional action, pressure for interim measures mounted. Many looked to the newly created Environmental Protection Agency for relief; and William Ruchelshaus, the first EPA administrator, responded quickly. Anxious to buoy public confidence in the federal commitment to environmental quality, Ruchelshaus set about to create a vigorous enforcement image for his neophyte agency. His strategy for establishing this reputation was two-pronged: extensive use of court suits and application of an effluent permit system. So extensive was his use of the former that EPA attorneys referred 371 enforcement actions to the Justice Department (DOJ) between 1970 and 1972. What is more, these were brought against such luminaries as the cities of Atlanta, Detroit, and Cleveland, as well as such industrial giants as U.S. Steel, Mobil Oil, and Cities Service.[38] Yet despite the herculean efforts of EPA under Ruchelshaus, the court strategy proved inadequate to the task, making "hardly a dent in the massive number of dischargers that required control."[39]

The effluent permit system established by Ruchelshaus was broad in scope and had as its legal basis Section 13 of the Rivers and Harbors Act of 1899, commonly referred to as the Refuse Act.[40] Prompted by two

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[38]Environmental Protection Agency, The First Two Years: A Review of EPA's Enforcement Program (Washington, D.C.: Office of Enforcement and General Counsel, February 1973), pp. 8, 68-91.

[39]Robert Zener, "The Federal Law of Water Pollution Control," in Federal Environmental Law, eds. Edmund Dolgin and Thomas Guilbert (New York: West Publishers, 1974), p. 1002.

[40]The Rivers and Harbors Act of 1899, 33 U.S.C. Section 407, 2 Environmental Law Review 41142.

Supreme Court decisions that construed the act as applying to any industrial waste,[41] President Nixon had ordered the establishment of a permit discharge system to be administered jointly by the Army Corps of Engineers and EPA. Shortly after one year of operation, however, the permit program was abandoned, rendered administratively infeasible by a U.S. Circuit Court of Appeals decision in Kalur v. Resor.[42] The court ruled that each permit issued—and EPA had received 23,000 permit requests—had to be accompanied by an Environmental Impact Statement (EIS) to satisfy the requirements of the National Environmental Policy Act (NEPA).[43] With the permit system aborted by the courts, the "suit strategy" rendered innocuous by the dimensions of the water quality problem, and the congressional calendar cleared of air quality legislation, the focus of environmental reform efforts returned to the national legislature. These efforts culminated in the enactment of comprehensive amendments to the FWPCA in 1972.

The FWPCA of 1972 has been termed "the most sweeping environmental measure ever considered by the Congress."[44] The magnitude of the congressional goals established by the Act supports this characterization. Section 101 declared that the restoration and maintenance of the "natural

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[41] United States v. Republic Steel Corp., 362 U.S. 482 (1960) and United States v. Standard Oil Co., 384 U.S. 224 (1966).

[42] Kalur v. Resor, 335 F. Supp. 1, 1 ELR 20637 (D.D.C., 1971).

[43] The National Environmental Policy Act, Pub. L. 91-190 (1969).

[44] FWPCA of 1972; the quotation is from Davies and Davies, Politics of Pollution, p. 44.

chemical, physical, and biological integrity of the Nation's waters" was the intent of Congress.[45] In pursuit of this ambitious goal, major waterways were to be fishable and swimmable by 1983 and total elimination of pollutant discharges was to be realized by 1985.[46] Building upon the infrastructure of the 1965 amendments, the new law again made state-set, EPA-approved water quality standards a critical element in its implementation scheme. Section 303 provided that within 180 days after enactment of the 1972 amendments, EPA was required to review for approval all interstate standards previously adopted by the states pursuant to the 1965 amendments.[47] Concurrently, the states were to develop water quality standards for intrastate waters; standards that EPA would also review. These were to take into account the "use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses."[48]

While much akin to its predecessor, the 1972 Act differed from it on two very significant dimensions. First, it provided for development of nationally-uniform, technology-based effluent limits that would have to be met in order for dischargers to obtain EPA-issued discharge permits. Secondly, the Act was more specific in delineating timetables for carrying out administrative responsibilities. Thus, reminiscent of the logic of the Clean Air Act of 1970, the Congress sought to drastically limit the discretion of agency implementors.

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[45] FWPCA of 1972, Sect. 101.

[46] Ibid.

[47] FWPCA of 1972, Sect. 303.

[48] Ibid.

The procedures, decision criteria, and action timetables established by the 1972 amendments were quite comprehensive. Under Section 304 of the Act, EPA was to issue effluent guidelines by October 1973 for categories of major polluters.[49] The cornerstone of the pollution control strategy, these guidelines were to serve as the basis for EPA's establishment of effluent standards limiting the amount of pollutants each industrial category could discharge.[50] These effluent limits were, in turn, to become the basis for pollution discharge permits (referred to popularly as NPDES permits) for individual polluters.[51] These permits were to be issued by EPA to all dischargers by December 1974. Pursuant to Section 301 of the Act, effluent limits were to be developed primarily on the basis of technological feasibility. Dischargers were required to employ the "best practicable control technology currently available" (BPT) by July 1, 1977, and the "best available technology economically achievable" (BAT) by July 1983.[52] What constituted the "best" technology for either of these categories, however, was left to the determination of the EPA.

Congress generally intended that the state water quality standards and the EPA effluent limits would be applied as uniformly as possible to individual dischargers within industrial categories. It did provide one

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[49] FWPCA of 1972, Sect. 304.

[50] FWPCA of 1972, Sect. 301.

[51] FWPCA of 1972, Sect. 402. The acronym "NPDES" refers to the National Pollutant Discharge Elimination System created by the Act.

[52] FWPCA of 1972, Sect. 301.

exception however: the application of these regulations to individual thermal pollution sources. Given that thermal pollution did not have the long-term consequences of more persistent pollutants such as DDT or PCB, and that the desire to take advantage of lax state standards or enforcement reputations was not a critical factor in determining plant sites, case-by-case enforcement was deemed acceptable.[53] Section 316 of the Act thus allowed dischargers such as TVA an opportunity to challenge any applicable thermal requirement on the grounds that it was more stringent than necessary to protect the aquatic environment.[54]

The 1972 amendments also provided specific enforcement resources if polluters failed to obtain discharge permits or violated any standard, limitation, or monitoring requirement. The agency could do any of four things: issue compliance orders, obtain injunctive relief, seek civil penalties of up to $10,000 per day, or attempt criminal prosecution.[55] Moreover, as it did in the CAA of 1970, Congress sought to constrain the enforcement discretion of implementors even further by incorporating a citizen suit provision in the Act. Section 505 of the FWPCA authorizes "any person having an interest which is, or may be adversely affected" to file suit against violators of effluent standards, or against EPA for failing to perform nondiscretionary duties in a timely, expeditious

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[53] Zener, "Federal Law of Water Pollution Control," p. 714.

[54] FWPCA of 1972, Sect. 316.

[55] FWPCA of 1972, Sect. 309.

manner.[56] The procedural requirements of this provision were taken from the CAA of 1970 and thus do not bear repeating in this section.

To summarize, thermal discharge was one of several types of water pollution that EPA was required to control during the 1970's. As EPA sought to apply its thermal policies to the TVA during this decade, it would have to work under several sets of organizational parameters provided by the FWPCA. Until enactment of the FWPCA of 1972, EPA's responsibility was derived from the FWPCA as amended through 1970. Given the cumbersome, essentially ineffectual, enforcement process provided by this legislation, EPA turned increasingly during the 1970-1972 period to a thermal pollution implementation framework that emphasized Refuse Act discharge permits, as well as court suit enforcement procedures. With the enactment of the 1972 amendments, thermal pollution abatement would subsequently be premised on the notion that control was possible through a system of state enacted ambient water quality standards and nationally promulgated effluent limitations for categories of industrial dischargers.

The centerpiece of enforcement under the 1972 amendments was to be a permit system (NPDES) administered initially by EPA. The permits would translate thermal water quality requirements for categories of industries into effluent limits for individual dischargers. The operators of these plants could, however, challenge the application of both state standards and effluent limits, claiming that they were more

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[56] FWPCA of 1972, Sect. 505.

stringent than necessary to protect the aquatic life of the bodies of water receiving their heat discharges. As a hedge against noncompliance, thermal water quality standards promulgated by the states could be used to halt construction or operation of plants requiring federal licensing. In the case of federal facilities such as TVA, however, no state certification would be required; EPA would be responsible for holding federal government polluters accountable to existing thermal standards. To limit abuse of administrative discretion by those charged with implementing the Act, Congress specified legally enforceable procedures, decision premises, and schedules for implementation. What is more, it provided that citizens could file suit against violators of the Act, as well as against the EPA absent timely, effective conduct of such nondiscretionary duties and procedures.

Discussion

This chapter has examined what Jones terms the organization activity of implementation: the specification of units and methods for effecting policy. The history, logic, and substance of the implementation designs provided by the CAA and FWPCA for interpreting and applying its SO_2 and thermal pollution policies to the TVA has been described in some detail. Both designs reflected the increasing assumption of federal responsibility for developing and enforcing pollution control policies in this country. As such they both represented the disaffection of Congress with the inability, some said the unwillingness, of the states to cope with environmental problems. Moreover, each incorporated congressional

determination to constrain the substantive and procedural discretion of all those implementing the acts' ambitious goals.

With this knowledge as background, it is now appropriate to compare and contrast the units and methods for effecting policy provided by each law as they relate to SO_2 and thermal pollution policy. When the two laws are juxtaposed in this fashion, three primary differences become apparent. First, they differ strikingly in terms of the decision criteria required by each. In the case of sulfur dioxide the EPA would have to take only health considerations into account when developing the national primary and secondary ambient air quality standards (NAAQS). In contrast, the agency would be able to premise thermal standards on both technological and economic feasibility factors as well. Moreover, while both acts required EPA or the states to develop uniform regulations applicable to all pollution sources, these would eventually have to be tailored to individual polluters in the case of thermal effluents. This was because individual thermal dischargers would be able to challenge the application of existing water quality standards to their plants under Section 316 of the FWPCA. Those discharging SO_2 were afforded no such opportunity under the CAA of 1970.

The second major difference concerns the assignment of administrative responsibilities to levels of government. While SO_2 ambient air quality standards would be promulgated by the EPA, thermal ambient water quality standards would initially be issued by state pollution control boards subject to EPA review. Similarly, while SO_2 and thermal discharges would be subject to enforcement schemes that incorporated the issuing of permits,

EPA would directly administer the thermal permit program while the states would be solely responsible for issuing operating permits to SO_2 dischargers.

Finally, the two laws differed in terms of the enforcement resources provided by each. While similar in their provision of suits, criminal penalties, and injunctive relief as enforcement mechanisms, two striking differences are apparent. First, while courts could impose civil penalties of up to $10,000 per day for violations of EPA enforcement orders, emission limits, and permit requirements dealing with thermal pollution, no comparable sanctions were available for enforcing SO_2 policies. Secondly, EPA could take advantage of the Section 21(b) provision of the FWPCA of 1972 when attempting to apply thermal policies to individual polluters; an enforcement tool unparalleled in the CAA. Pursuant to that provision, anyone applying to a federal agency to obtain a license for constructing or operating a potential source of thermal pollution would have to receive state certification that the operation of the facility would not violate applicable state thermal standards. In the case of federal government facilities such as TVA, standard compliance would have to be ensured by EPA. In contrast, no such provision for adding additional enforcement leverage was available to EPA under the provisions of the CAA.

Having described the "hands and swords" of the implementation framework provided by the CAA and the FWPCA for effecting SO_2 and thermal pollution policies, it is now possible to turn to the specifics of EPA's experiences in interpreting the acts as each would subsequently

apply to TVA. Chapter III will recount the substance, process, and issues involved in three of EPA's most fundamental interpretations. First, how strict did Congress intend pollution standards to be? Second, how did it intend pollution to be controlled? And third, who did it intend pollution control requirements to apply to?

CHAPTER III

THROUGH THE LOOKING GLASS DARKLY: INTERPRETING THE CAA AND FWPCA

V. O. Key has written that "to speak with precision of public opinion is a task not unlike coming to grips with the Holy Ghost."[1] No less metaphysical a task often awaits those seeking to comprehend the legislative intent of the United States Congress when it passes a law. And no less is expected of public managers implementing the provisions of that law. Confronted by ambiguous, even contradictory statutory language, administrators must somehow perform what Jones terms the interpretation activities of implementation: the translation of statutes into feasible, acceptable program directives.[2] As Edelman has suggested, the rub typically lies wherein statutory imprecision begets "differing interpretations of the same language with different authorities, changing times, altered conditions, and varying interest groups."[3] No more apt characterization exists for describing EPA's efforts to interpret the CAA and FWPCA during the 1970's.

This chapter describes three basic interpretations of congressional intent that EPA had to make before it could apply these laws specifically

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[1]Key, Public Opinion, p. 14.

[2]Jones, Study of Public Policy, p. 139.

[3]Murray Edelman, The Symbolic Uses of Politics (Urbana: University of Illinois Press, 1964), p. 141.

to TVA. These concerned (a) the stringency of pollution standards, (b) the acceptability of pollution control techniques, and (c) the determination of to whom policies should be applied. Recounted are the issues encompassing these decisions, as well as the process and substance of EPA's efforts. A comparison of the agency's experiences in translating the two acts concludes the analysis.

Interpreting the CAA

As noted in the previous chapter, the Clean Air Act represented an earnest attempt by Congress to constrain the discretion of federal and state administrators charged with effecting clean air policy. Specific tasks, with legally enforceable schedules for their accomplishment, were assigned to officials at both levels of government. EPA was to issue health-based ambient air quality standards (NAAQS) for pollutants such as SO_2; to review, for approval or modification, plans developed by the states for effecting these standards (SIP's); to assume direct enforcement responsibility, if necessary, of any SIP provision; and to initiate implementation absent sufficient state efforts. The states were to develop and enforce implementation plans (SIP's) that would, among other things, establish both emission levels and compliance schedules for individual polluters. In contrast to its precision in specifying tasks and timetables for implementation, however, Congress failed to clearly state, or rank in priority, many of its most pressing goals. Most significant for the EPA/TVA SO_2 controversy were the ambiguities surrounding what constituted adequate

margins of safety to protect human health, the imprecision as to acceptable control strategies for reducing SO_2 emissions from coal-fired steam power plants, and the confusion over application of emission standards to federal facilities.

The Adequate Margin of Safety Question

Pursuant to the CAA of 1970, EPA was to establish a primary air quality standard for SO_2 that would allow an "adequate margin of safety" to protect the public health. Proposed standards were to be published for public comment on January 30, 1971 and final standards issued on April 30, 1971. But Congress gave little indication of what the term "adequate" meant or how it was to be measured. Such critical details were neglected in the Act itself and in the committee reports accompanying the statute. Operationalizing this slippery, albeit fundamental concept by the Act's deadlines was thus sublimated to the sublegislative process for resolution by the nation's newest environmental agency.

In an ideal world of precise congressional intent and perfect scientific knowledge, setting an adequate standard would have been a rather perfunctory task for the EPA. Knowing the precise point at which SO_2 concentrations would be deleterious to the health of particular segments of the public, the agency could simply set standards below this harm-inducing threshold. As Majone notes, however, "firm knowledge about the amount of damage done by given concentrations under various environmental conditions is simply not available."[4]

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[4]Majone, "Regulatory Decision-Making," 577.

Uncertain was whether SO_2 was independently responsible for causing and aggravating respiratory health problems. Many scientists believed not, claiming instead that particulate matter, the synergistic effects of SO_2 interacting with airborne substances and meteorological conditions, or toxic materials yet unidentified were more likely explanations of such problems.[5]

The EPA did not have the data base or the research resources to resolve these issues.[6] Also unavailable was the luxury of waiting for their resolution by others. Pressed by the deadlines of the CAA, the agency proposed and subsequently promulgated NAAQS for SO_2 on schedule in 1971.[7] Since EPA had been in existence less than two months when it first proposed SO_2 standards, the agency premised these standards on highly controversial health criteria developed by its predecessor at the Interior Department. In so doing, EPA had opted for standards that dealt only with the independent effects of the pollutant; no consideration was given to the synergistic effects of SO_2 in combination with meteorological conditions and other pollutants. Moreover, the agency had set the standards to protect those already afflicted by respiratory disease rather than to merely lessen the likelihood that those

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[5]Tobin, Social Gamble, p. 83.

[6]Ibid.

[7]In January and March of 1971, EPA issued proposed national SO_2 primary and secondary ambient air quality standards [36 Fed. Reg. 1502 et seq. (1971) and 36 Fed. Reg. 5867 (1971)]; binding NAAQS for the pollutant were issued on April 30, 1971 [36 Fed. Reg. 8186 et seq. (1971)].

unafflicted would fall victim. With standards set in this fashion EPA, TVA, and the states of Alabama, Kentucky, and Tennessee were placed on a collision course. For national standards to be met, the operations of TVA power plants would have to be significantly altered.

The remarks of EPA Administrator Ruchelshaus in promulgating these regulations both reflected EPA's interpretation predicament and presaged points of future controversy. He began by noting that public comments received by EPA when the NAAQS were originally proposed reflected "divergences of opinion among interested and informed persons as to the proper interpretation of available data."[8] He also conceded that the absence of definitive evidence documenting the relationship of SO_2 in differing concentrations and over disparate time periods to a variety of health problems allowed but a best approximation of what "an adequate margin of safety to protect human health might be."[9] But to those who counseled delay in issuing standards until definitive data could be collected he responded in two ways. First, he cited the imminent, highly credible threat of citizen suits against EPA should the implementation schedules provided by the CAA be ignored. Secondly, he asserted that "the need for increased knowledge of the health and adverse effects of air pollution cannot justify failure to take action based on knowledge presently available."[10]

Some suggest that "the setting of air quality standards is a political, and not a scientific, responsibility" since it represents a

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[8] 36 Fed. Reg. 8186.

[9] Ibid.

[10] Ibid.

decision as to how much risk a community is willing to accept.[11] Equally political is the defense of such standards once they are issued, particularly when they are premised on ambiguous congressional intent and admittedly inconclusive scientific evidence. Once issued, the adequacy of SO_2 standards did indeed become the grist for political mills at all levels of the federal system and by all branches of government. Given the kinds of political and economic interests affected by the standards, perhaps no less could be expected. To effectively control SO_2 is to require costly changes in the operations of such economic titans as the coal, steel, and electric power industries. These changes are often perceived as jeopardizing the employment opportunities of such politically potent union memberships as the United Mine Workers and the International Brotherhood of Steel Workers. Moreover, the standards can exacerbate oil shortage and balance of payment problems should substitutions for coal be made; problems that fall within the purview of other government agencies. But EPA's travails in preserving and applying these standards to polluters in general, and to TVA in particular, are more appropriately the subject of the next chapter.

The Sulfur Dioxide Control Strategy Question

The Clean Air Act requires that within nine months of the promulgation of the national ambient air standards, the states must obtain EPA approval for plans implementing them. Known as state implementation plans (SIP's) these documents were, among other things, to specify

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[11] Tobin, Social Gamble, p. 10.

emission limitations, compliance schedules for individual polluters, and acceptable pollution control strategies for meeting compliance goals. Since TVA's twelve coal-fired power plants were located in Alabama (two plants), Kentucky (two plants), and Tennessee (eight plants), the agency's operations were subject to the EPA-approved SIP's of each of these states. While the agency would impugn as overly strict several of the emission limits issued by these states, TVA's most virulent attacks were reserved for EPA's interpretation of acceptable strategies for controlling pollution. With the CAA calling only for "such . . . measures as may be necessary to insure attainment and maintenance" of the national primary and secondary air quality standards (NAAQS), there was ample room for viable challenge.[12]

Basically, the control strategy question centered on whether Congress intended the actual reduction of total SO_2 emissions released into the atmosphere or merely the lowering of SO_2 concentrations in the vicinity of polluting sources such as TVA power plants. Depending on which interpretation prevailed, EPA would require the installation of either emission reduction or emission dilution control technologies. If it chose emission reduction, only constant control systems (CCS) that reduced the amount of SO_2 leaving the smokestack would suffice.[13] Thus

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[12] CAA of 1970, Sect. 110.

[13] See Richard E. Ayres, "Enforcement of Air Pollution Controls on Stationary Sources under the Clean Air Amendments of 1970," Ecology Law Quarterly 4 (1975): 453. Constant Emission Controls are defined as

the use of costly low-sulfur coal of questionable availability, along with the installation of expensive and unproven scrubber technology, would be required. To choose emission dilution would mean that intermittent control systems (ICS) and the construction of less costly, technologically proven tall smokestacks that merely lowered local SO_2 concentrations would suffice.[14]

From the perspective of all interests concerned, the stakes riding on EPA's interpretation of permissible control strategies were very high. Many scientists and environmentalists contended that while relatively inexpensive and easy to implement, the ICS approach was "flawed by pervasive problems of reliability and enforceability."[15] Moreover, they excoriated these techniques for "[exacerbating] the problem of derivative pollutants, [subjecting] previously clean areas to new pollution risks, [encouraging] 'acid rain,' [limiting] future economic growth, and [reducing] the incentive for development of superior

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"either a manufacturing process that is inherently low polluting, or a system for continuously reducing the emissions before they reach the ambient air (such as flue gas desulfurization)." Christopher Davis et al., "The Clean Air Act Amendments of 1977: Away from Technology-Forcing?," Harvard Environmental Law Review 2 (1977): 35.

[14]Intermittent Control Systems (ICS) "require monitoring the air quality in an area and either shutting down or reducing emissions when meteorologic conditions adversely affect dispersion." ICS may also include the use of tall smokestacks to disperse "emissions over such a large area that they result in low ambient air concentrations at ground level near the source." Davis et al., "Clean Air Act Amendments of 1977," 35.

[15]Ayres, "Enforcement of Air Pollution Controls," 454.

control technologies."[16] For power plant operators such as TVA, however, ICS strategies were especially attractive. They would allow plants to meet SO_2 standards in the immediate vicinity of their operation, the only area where pollution could realistically—and hence legally—be attributed to a particular source. What is more, they could meet virtually any standard at considerably less expense.

EPA's evolving, rather tortuous interpretation of appropriate control strategies began in April 1971 with its publication of proposed guidelines for SIP development.[17] After encouraging and evaluating comments on the proposals, EPA prepared and informally circulated a draft of final guidelines during the month of June. These prospective guidelines were a "pleasant surprise" to environmentalists since they said "nothing about cost considerations and neglected many of industries' other social and economic concerns."[18] But the guidelines formally promulgated by EPA in August 1971 differed considerably from the June draft. Especially dismaying to environmentalists were a "series of stipulations which . . . [were] intended to encourage states to consider the relative social and economic impacts of alternative control strategies before selecting the one(s) they [would] employ."[19] Most felt this was the Republican administration's invitation to state

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[16] Davis et al., "Clean Air Act Amendments of 1977," 35.

[17] The proposed SIP Guidelines were issued April 7, 1971. See 36 Fed. Reg. 6680 et seq. (1971).

[18] Tobin, Social Gamble, p. 95. [19] Ibid.

officials to allow SO_2 emission dilution rather than reduction given the cost disparity between intermittent and constant control strategies.

The original Alabama and Tennessee SIP's were submitted to EPA for approval in January 1972. The initial Kentucky plan followed in early February of the same year.[20] Under each plan the TVA, as a major source of SO_2 pollution, was required to meet emission standards by mid-1975, but the control strategy options offered by Kentucky and Tennessee did not require the use of constant control systems. Specifically, they provided that "operators could demonstrate that other techniques [rather than constant control systems] would permit the attainment and maintenance of national standards."[21] The question remained, however, whether these provisions would be acceptable to the EPA.

Approximately two weeks before Administrator Ruchelshaus published EPA's review of the proposed SIP's in the Federal Register, EPA notified then-Governor Jimmy Carter of Georgia that intermittent controls such as tall stacks would not be considered an acceptable control technique.[22] Nonetheless, when legally binding SIP's were issued in May 1972

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[20]See 37 Fed. Reg. 10847 (1972); 37 Fed. Reg. 10894 (1972); and 37 Fed. Reg. 10868 (1972).

[21]U.S. Environmental Protection Agency and the Tennessee Valley Authority, Preliminary Assessment of Alternative Sulfur Oxide Control Strategies for TVA Steamplants (Knoxville: Tennessee Valley Authority, June 1974; revised January 1975), p. 4-4. Hereafter referred to as the EPA/TVA Task Force Report.

[22]Buckeye Power, Inc. v. EPA, 481 F 2d 162 (1973), citing letter from Jack E. Raven, U.S. Environmental Protection Agency, to Governor Carter, May 7, 1972.

Ruchelshaus neither approved nor disapproved their use.[23] Instead, if states accepted ICS as a control strategy for polluting sources (such as TVA plants), EPA would treat the action as a revision to the SIP. Consequently, the decision would be subject to EPA review.[24] Forced by CAA deadlines to promulgate SIP's before sufficient evidence could be marshaled on this and other critical issues, EPA had opted to buy time.

In promulgating the SIP's the agency had also warned the states that they might need to make future revisions in their plans as EPA made a "continuing evaluation" of their provisions.[25] The first indication of the need to do so came but two months after the agency's admonition. In July 1972, EPA proposed a regulation disallowing ICS as a compliance technique.[26] This proposal, however, was never officially promulgated by the agency. Almost a year later, in September 1973, EPA reversed its proposed position on ICS. This time it offered for public comment a regulation permitting ICS and tall stack compliance strategies.[27] Again,

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[23] 37 Fed. Reg. 10842 et seq. (1972).

[24] 37 Fed. Reg. 10845, 10846 (1972).

[25] 37 Fed. Reg. 10842 (1972). [26] 37 Fed. Reg. 15095 (1972).

[27] 38 Fed. Reg. 25697 et seq. (1973). Exactly how far this proposed regulation went in allowing tall stack/ICS is a matter of some dispute. TVA has contended that this regulation would only have allowed tall stack/ICS on a temporary basis [Tennessee Valley Authority, "Chronology of TVA Sulphur Dioxide Control," provided by TVA Attorney Barry Walton (Knoxville: Tennessee Valley Authority, June 1979), p. 2]. Critics of ICS saw this proposed regulation as a reversal of EPA's previously proposed disallowal of tall stack/ICS (see Ayres, "Enforcement of Air Pollution Controls," 456-457). Apparently, this EPA proposed regulation did not entirely satisfy either the proponents or opponents of tall stack/ICS.

however, this rule was never actually issued.[28] Confusion seemed to reign at EPA.

In the fall of 1973 what Justice Holmes might term the felt necessities of the times began to impinge on EPA's interpretation efforts. As the nation braced to confront both an OPEC oil embargo and persistent economic stagflation, it became popular to attack environmental regulations as inflationary and as jeopardizing the nation's energy independence goal. The most vociferous private sector barrage against EPA's efforts came from a $3.5 million antiscrubber advertising campaign spearheaded by the American Electric Power Company.[29] This was accompanied by mounting criticism from within the federal government itself. Indeed, a formal executive branch review of environmental regulations—known as the Quality of Life Review Process—was formally instituted by the Office of Management and Budget (OMB). Under this system, any federal agency was given an opportunity to influence, and perhaps even alter, EPA's regulatory policies by formally expressing concern about their impact on national energy shortages or the economy in general. Taking advantage of this opportunity, such agencies as the Federal Power Commission (FPC), the Federal Energy Administration (FEA), the Commerce Department, and OMB pressed Congress and the President for approval of intermittent control

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[28]Ayres, "Enforcement of Air Pollution Controls," 459.

[29]See "Donald Cook vs. EPA," New York Times, November 24, 1974, pp. F1, 14; and "Tall Stacks versus Scrubbers: $3.5 Million Publicity Campaign Fails to Discredit Emission Reduction Technology," Environmental Law Reporter 5 (1974): 10009-10010.

strategies. The Commerce Department even used the process to develop amendments to the Clean Air Act that President Ford eventually submitted to Congress.[30]

EPA responded to all this by inviting the states to review their SIP's so as to eliminate "overly stringent" provisions that discouraged the use of our abundant coal resources.[31] This invitation was well-received by the states where TVA operated its coal-fired plants. Tennessee and Alabama proposed increased SO_2 emission limits that ICS systems could easily meet,[32] and Kentucky specifically proposed allowing ICS as a compliance technique.[33] The EPA formally responded to the proposed SIP changes of these states in August 1974, almost eight months after the Tennessee and Alabama changes were submitted. The oil embargo had by then been lifted, and gone was the crisis atmosphere supporting its earlier call for SIP relaxations. The agency disallowed many of the emission standard proposals proffered by Alabama and Tennessee,[34] and it forbade Kentucky's provision specifically allowing ICS as a control strategy.[35] This action was followed in December of the same year by the promulgation of binding EPA regulations mandating constant control

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[30]See E. E. Kenworthy, "EPA Aides Say Commerce Department Amendments Would Weaken Clean Air Act," New York Times, December 10, 1974, p. 31.

[31]EPA/TVA Task Force Report, p. 4-4.

[32]38 Fed. Reg. 34476 (1973); 38 Fed. Reg. 34477 (1973).

[33]39 Fed. Reg. 10277 (1974).

[34]39 Fed. Reg. 38528 (1974); 39 Fed. Reg. 38529 (1974).

[35]39 Fed. Reg. 28357 (1974).

systems. This was done in the face of controversy over the environmental problems caused when disposing of the huge quantities of "sludge" produced during the operation of scrubbers, and amidst uncertainty over the availability of low-sulfur coal.

After more than two and a half years of vacillation, the agency had finally taken an official, legally-binding position on the control strategy issue. It had come to support emission reduction rather than dilution regardless of the economic and technological feasibility of such constant control techniques as scrubbers and low-sulfur coal. In the process it had taken a position that would bring the EPA into open, very heated confrontation with the Tennessee Valley Authority during the 1970's.

The Federal Facility Compliance Question

The final interpretation issue that bore directly on the EPA/TVA dispute dealt with the responsibilities of federal facilities under the Clean Air Act. Impatient with prior federal facility pollution control efforts, and recognizing that such facilities were among the most notorious SO_2 polluters in the country, Congress used the CAA to vent its displeasure. As Stewart and Krier suggest the TVA, as the nation's largest SO_2 polluter, was a primary target of congressional ire.[36] Section 118 provided that all federal facilities discharging air pollutants "shall be subject to, and comply with, all federal, state, interstate, and local requirements respecting the control and abatement

[36]Stewart and Krier, Environmental Law, p. 553.

of air pollution in the same manner, and to the same extent, that any person is subject to such requirements."[37] Left unclear, however, was whether facilities were subject to the procedural requirements imposed by the states to implement the Act.

For most states, the heart of the pollution control program was a procedure whereby stationary sources (e.g., power plants) were required to obtain a permit to operate. These permits were designed to mediate the "gap between pollution sources and national standards,"[38] and allowed state and local authorities to regulate air pollution directly at the source. Aided by monitoring devices, officials would presumably be able to determine exactly when and how ambient air quality standards and emission limitations were being violated, as well as by whom. Environmentalists believed that Section 118 authorized the states to regulate federal facility pollution in the same fashion as that of private sources. However, as William Shaw has noted, "The simplicity of the proposal [failed to] ensure its acceptance."[39] Many federal facilities, including the TVA, avered that Section 118 violated the Supremacy Clause of the U.S. Constitution and the legal principle of sovereign immunity. While acknowledging that the Act did allow state

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[37] CAA of 1970, Sect. 118.

[38] Bill M. Shaw, "Sovereign Immunity: Federal Compliance with State Permit Requirements under the Clean Air Act and the Federal Water Pollution Control Act Amendments," San Fernando Valley Law Review 6 (Spring 1978): 120.

[39] William R. Shaw, "The Procedures to Ensure Compliance by Federal Facilities with Environmental Quality Standards," Environmental Law Reporter 5 (1975): 50215.

and local authorities to impose substantive air quality standards on their operations, federal facilities argued that it did not authorize the imposition of state permit requirements.[40]

The position espoused by federal facilities was completely unacceptable to environmental groups who maintained that for all practical purposes it emasculated the CAA. The perspective of environmental groups was subsequently adopted by the EPA. In seeking to counter the position that federal facilities could not be held to procedural requirements under Section 118, the agency argued that such an interpretation essentially granted federal facilities a dispensation from the law. To deny state and local governments the authority to impose procedural requirements on federal installations was, the EPA suggested, to create an "enforcement vacuum which rendered the 'duty' of federal facilities to comply with the CAA 'utterly meaningless.'"[41] Moreover, it occasioned a "dichotomy between federal and private industrial polluters which [could force] the latter to undertake burdensome abatement measures that federal polluters were able to avoid."[42]

The EPA and TVA were thus placed at loggerheads over the federal facility compliance issue. TVA would concede that it had to meet national SO_2 standards and emission limitations just as any polluter

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[40] Ibid.

[41] Davis et al., "Clean Air Act Amendments of 1977," 77.

[42] Ibid.

might have to, but that it did not have to apply to the states for a permit to operate its coal-fired power plants. EPA, the states, and environmentalists would argue that TVA not only had to meet the standards issued pursuant to the CAA, but had to comply with the procedural requirements of the states as well. Before this issue was finally resolved by Congress in 1977, TVA would wage a determined, very nearly successful campaign challenging EPA's interpretation of Section 118 of the CAA.

Interpreting the FWPCA

During the EPA/TVA thermal pollution dispute, EPA's interpretation of both the 1965 and 1972 amendments to the Federal Water Pollution Control Act would have a significant effect on the operations of TVA's nascent nuclear power program. Recall that prior to the enactment of the 1972 Act the control of excessive heat discharges from power plants such as those operated by TVA was predicated on the Water Quality Act of 1965. Pursuant to these amendments to the FWPCA each state, subject to federal approval, was to issue water quality standards based on intended use for all interstate waters by June 1967. These standards were to be accompanied by a plan for their implementation and enforcement. In the absence of state action, the Interior Department (later the EPA) could promulgate standards in their stead. Moreover, should the state plan, or any of its parts, prove inconsistent with the purposes of the Act, a federal standard-setting conference could be convened to issue acceptable standards. Once issued these were to be considered federal standards, directly enforceable by the federal government.

The FWPCA of 1972 incorporated much of the regulatory framework of the 1965 amendments. States were again to develop water quality standards for interstate waterways and to provide implementation plans for their application and enforcement. Moreover, all state efforts were subject to approval by the EPA. The 1972 amendments differed fundamentally, however, from their predecessor by calling for the development of nationally-uniform, technology-based effluent limitations prepared by EPA rather than the states. These standards, in turn, were to be the basis for EPA-issued NPDES operating permits for individual sources of pollution. As with the CAA of 1970, these assigned tasks were accompanied by legally-enforceable performance deadlines. EPA was to issue effluent guidelines for major industrial polluters by 1973; grant NPDES discharge permits to all pollution sources by 1974; require industry to install the best practicable control technology (BPT) by 1977; ensure that polluters applied the best available control technology (BAT) by 1983; make navigable waterways fishable and swimmable by 1981; and see to it that all discharges into the nation's waterways were eliminated by 1985.

John Quarles, former deputy administrator of the EPA, has written that the FWPCA as amended through 1972 "presented a rather bewildering array of requirements" that the agency had to translate into feasible, acceptable program directives.[43] Three products of EPA's taxing interpretation experience were especially salient for the EPA/TVA

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[43]Quarles, Cleaning Up America, p. 114.

thermal pollution controversy. These included the agency's directives concerning acceptable thermal pollution standards, technology-based effluent limitations, and grounds for individual plant exemptions from thermal pollution requirements.

The Thermal Water Quality Standard Question

The 1965 amendments had called on each state to develop and submit for federal approval a set of water quality standards. These would define the maximum permissible levels of various pollutants consistent with the projected uses of a given waterway.[44] A commission established by the Interior Department recommended that standards for thermal pollution be issued pursuant to that mandate. Then in the 1972 amendments to the FWPCA, Congress stipulated that any adopted state water quality standard approved or awaiting approval under the terms of the 1965 amendments could be challenged by EPA.[45] In the event of a challenge, EPA was to notify the state and specify changes that had to be adopted within ninety days of notification. If revisions were not forthcoming, EPA could promulgate the necessary changes and hold polluters accountable to them. The primary vehicle provided for doing this was a standard-setting conference convened by EPA where arguments for and against revision could be presented by any interested party.

Most significant for the EPA/TVA controversy, Alabama and Tennessee—two states where TVA would choose to locate most of its

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[44] The Water Quality Act of 1965, Sect. 303.

[45] FWPCA of 1972, Sect. 303.

nuclear generating capacity—were concerned about excessive heat discharges into the Tennessee River. To allay their fears, they would develop thermal pollution standards for portions of that river flowing within their respective boundaries. During the 1970's, EPA's review of these adopted standards would seriously affect the operations of the TVA nuclear power program and engender disagreement between the two federal giants. At issue would be EPA's interpretation of the Act's imprecise mandate to determine "maximum permissible levels" of pollution for discharges of thermal effluents. At stake would be several hundred million dollars worth of construction costs for installing auxiliary cooling tower systems at TVA nuclear plants; towers needed to meet thermal standards viewed by TVA as unnecessarily stringent to protect water quality.

In contrast to SO_2 pollution, the cause/effect relationship underlying thermal pollution concerns was widely accepted and well documented by the federal government: excess heat discharges did kill fish and other aquatic life.[46] The major source of thermal pollution was uncontested as well: the disposal of waste heat from steam electric generating plants, with nuclear units responsible for 40 to 60 percent more heat discharge than comparable fossil-fueled facilities.[47] Less

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[46]An inventory of thermal fish kills has been maintained by the federal government since 1962. See Michael S. Baram, "The Legal and Regulatory Framework for Thermal Discharge from Nuclear Power Plants," Environmental Affairs 2 (Winter 1972): 519, footnote 10.

[47]Russell L. Johnson, "Thermal Pollution: The Electric Uitility Industry and Section 21(b) of the Federal Water Pollution Control Act," The Hastings Law Journal 22 (February 1971): 688.

clear, however, were the more technical questions associated with heat discharges. For instance, what amounts of heat, at what temperatures, in what concentrations, and in combination with what climatic conditions actually harm different species of fish, at different life stages, and over different exposure levels?[48] Further complicating such issues was the tendency for their answers to vary from site to site and to be unamenable to usual predictive modeling.[49] Thus, not unlike the SO_2 standard-setting dilemma, the EPA and its predecessors were charged with determining "permissible" standards absent sufficient technical supporting data.

The 1965 amendments did not allow time for resolving scientific uncertainties. As stipulated by Congress, the states were to submit water quality standards for federal review by June 1967. The Act did provide, however, that criteria guidelines would be developed by a group of water quality experts to aid the Interior Department (and subsequently the EPA) in reviewing proposed state standards. This group, known as the National Technical Advisory Commission, issued interim recommendations for thermal pollution that were available to federal officials when the first state proposals were submitted. These criteria were based on approximations of what constituted "natural" temperatures for particular bodies of water and stipulated the

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[48]See Frank L. Parker and Peter A. Krenkle, Engineering Aspects of Thermal Pollution (Nashville: Vanderbilt University Press, 1969), and Johnson, "Thermal Pollution."

[49]Geoffrey G. Eichholz, Environmental Aspects of Nuclear Power (Ann Arbor: Ann Arbor Science Publishers, 1976), p. 223.

maximum temperature variations that different aquatic life could sustain.[50]

While many states adopted thermal standards compatible with the Advisory Commission's guidelines, some did not. The states of Alabama and Tennessee fell into the latter category. After holding extensive public hearings where interested parties, including TVA, testified as to appropriate standards, the Alabama Water Improvement Commission approved in May 1967 a 93°F temperature maximum and a 10°F temperature rise for portions of the Tennessee River where TVA was planning to locate its Brown's Ferry nuclear plant.[51] These were submitted to federal officials in June of that same year.[52] Because they contrasted so sharply with the Commission's recommendations of an 86°F maximum and 5°F temperature rise, Alabama's proposed standards were disapproved in February 1968. While protracted negotiations between federal and state officials ensued, as of February 1971 a resolution of the disagreement was still not in sight. Consequently, EPA Administrator Ruchelshaus authorized a standard-setting conference for April 1971 in

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[50]Robert S. Burd, "Water Quality Standards for Temperature," in Engineering Aspects of Thermal Pollution, eds. Frank L. Parker and Peter A. Krenkle (Nashville: Vanderbilt University Press, 1969), pp. 74-75.

[51]33 Fed. Reg. 9877 (1968).

[52]Environmental Protection Agency Water Quality Office, Region IV, Atlanta, Water Quality Standard-Setting Conference for the Inter-State Waters of the State of Alabama (Montgomery: Environmental Protection Agency, April 5-7, 1971), p. 3.

Montgomery, Alabama.[53] As a result of this conference, EPA officially promulgated an 86°F maximum and a 5°F change limit for sections of the Tennessee River in Alabama.[54]

Much the same pattern was followed in the development of Tennessee's thermal water quality standards. In May 1967 the state water pollution commission proposed a 93°F maximum and 5.4°F rise standard for portions of the Tennessee River where TVA's Sequoyah nuclear plant would be located.[55] This proposal was rejected by federal officials in favor of an 86.9°F maximum and 5.4°F rise limitation.[56] Negotiations extended from this disapproval in 1968 until the state voluntarily issued standards consistent with EPA's interpretation of permissible thermal limits in December 1971.[57] EPA formally approved these revised standards in June 1972. Thus the EPA had pressured the states of Alabama and Tennessee—where all but one of TVA's nuclear plants would eventually be housed—to adopt thermal water quality standards more stringent than TVA viewed necessary. If successfully applied to the federal facility, the standards would force TVA to construct—against its wishes—very costly auxiliary cooling tower systems at its nuclear plants.

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[53] 36 Fed. Reg. 3085 (1971).

[54] 37 Fed. Reg. 5260 (1972).

[55] 33 Fed. Reg. 9879 (1968).

[56] Bruce A. Brye, "TVA Activities to Control Heated Water Discharges," a paper presented to the Alabama Society of Professional Engineers State Convention, Huntsville, June 2-3, 1972, p. 8.

[57] 33 Fed. Reg. 9877 (1968); Tennessee Valley Authority, Final Environmental Statement—Sequoyah Nuclear Plant, Units 1 and 2 (Chattanooga: TVA, February 13, 1974), p. 2.6-2.

The Technology-Based Effluent Limitation Question

Pursuant to Section 301 of the FWPCA of 1972, all existing sources of pollution were to meet two levels of technology-based effluent limitations.[58] By 1977, polluters were to meet limits premised on the "best practicable technology currently available" (BPT); by 1983, they were to comply with standards based on "the best available technology economically achievable" (BAT).[59] The task of translating these vague congressional intentions into feasible, acceptable directives was delegated to the EPA. Section 304 charged the agency with identifying the amounts of effluent reduction technologically possible for classes of industrial polluters.[60] To translate these effluent limitations into regulations for specific dischargers, Section 402 authorized the EPA to issue pollution discharge permits to individual sources of pollution.[61]

EPA's interpretation of these provisions of the 1972 amendments was very important to the TVA nuclear power program. The great quantities of heated water anticipated to be released from its nuclear plants when the system was completed fell within the rubric of the Act. As steam electric generating plants, TVA's nuclear units would be responsible for meeting the thermal effluent limits developed for that industrial category by EPA; this, in order to obtain permits for

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[58] FWPCA of 1972, Sect. 301. [59] Ibid.

[60] FWPCA of 1972, Sect. 304.

[61] FWPCA of 1972, Sect. 402. These are the National Pollutant Discharge Elimination System Permits referred to in Chapter II.

discharging heated water from these facilities. EPA directives on this matter could significantly affect both the capital and operating costs of the TVA. What is more, TVA's responses to the directives could significantly affect its ability to meet the power generation needs of agency customers in the Tennessee Valley.

EPA's interpretation of the law was severely complicated, however, by the absence of a sufficient data base for promulgating technology-based effluent limits. Congress had charged the EPA with regulating over 200,000 industrial polluters. Such a responsibility required reams of information "about the discharges, manufacturing processes, and technical options of diverse firms operating in different circumstances throughout the country."[62] The agency approached this herculean task by dividing water polluters into thirty categories and 250 subcategories based on such criteria as product, process, size of plant, and age of equipment.[63] EPA staff were then dispatched to industries across the country to develop a satisfactory data base for developing the standards. This effort demonstrated to EPA officials that while Congress assumed that "best" pollution control technologies for industrial types must exist, industry had identified no such process. It thus appeared to many that a single technology-based effluent limitation was unrealistic given the contemporary state of water pollution control.[64]

Given such a scenario it is not surprising that the procedural deadlines established by the FWPCA of 1972 were not met by the EPA.

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[62]Marcus, Promise and Performance, p. 149.

[63]Ibid.

[64]Ibid., p. 152.

According to the Act, the agency was to issue effluent guidelines by October 1973 in order that pollution discharge permits—based upon such guidelines—could be issued to individual pollution sources. However, it was only by virtue of a law suit filed by the National Resources Defense Council (NRDC) that guidelines for approximately thirty industrial categories were issued by a reluctant EPA in January 1974.[65] And it was not until March 1974 that effluent guidelines were proposed for thermal pollutants discharged by steam electric generating plants such as TVA's nuclear units.[66] After holding an extended period of public comment and hearings to weigh the arguments of utility industry and environmental groups, EPA issued final regulations for thermal pollution in October 1974.[67]

In issuing these guidelines EPA maintained that the agency had "identified closed cycle evaporative cooling [i.e., cooling towers] as a technology which is clearly the most efficient means of virtually eliminating heated water discharges."[68] Moreover, the agency designated closed-cycle cooling systems as the technological basis for all effluent limitations.[69] This it did despite charges that towers caused environmental problems such as fog, icing, and weather modifications. In doing so EPA had effectively precluded the use of anything but closed-cycle cooling towers at TVA nuclear plants. Its decision would seriously alter

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[65] Ibid.

[66] 39 Fed. Reg. 8294 (1974).

[67] 39 Fed. Reg. 36187 (1974).

[68] Ibid.

[69] Ibid.

TVA's pollution control strategy—at considerable expense to the agency—if applied successfully to it.

The Thermal Pollution Exemption Question

The final aspect of EPA's interpretation of the FWPCA that would affect the TVA nuclear power program involved Section 316 of that act. Congress had authorized EPA to assign less stringent thermal pollution requirements to individual polluting sources under certain circumstances. The owner or operator of a plant had to satisfy EPA that the applicable limit or standard was "more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made."[70] Congress made no mention, however, of just how a polluter was to convince the administrator of worthiness for dispensation. Rather, this was left to the discretion of EPA. TVA, of course, would follow the agency's deliberations with more than passing interest. EPA's interpretation of what constituted evidence warranting alternative thermal standards and limitations could either exempt it from, or impose upon it, costly pollution control modifications.

EPA's interpretation began in March 1974, almost a year and a half after passage of the 1972 amendments.[71] At that time it issued proposed regulations for public comment that described the procedural and evidentiary requirements for obtaining alternative standards. In June,

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[70] FWPCA of 1972, Sect. 316.

[71] 39 Fed. Reg. 11434 (1974).

EPA representatives testified before a House Public Works subcommittee examining its proposals.[72] This was followed in July by two days of EPA-sponsored public hearings concerning the regulations and an accompanying guidance document for their implementation.[73] A final defense of its Section 316 proposals came in late July when EPA participated in a conference sponsored by the Atomic Industrial Forum.[74] Befitting the importance of EPA's decision on this matter, all of these meetings were heavily attended by both electric utility industry representatives (including TVA) and environmental groups.

The final regulations published in October 1974 established three ways for point source operators such as TVA to demonstrate that alternative thermal standards were justified.[75] First, operators could show that the existing discharge from a plant had not caused "prior appreciable harm" to aquatic life, and consequently had not disturbed the "balanced indigenous community" of fish and wildlife in or on the receiving body of water. In making this demonstration the interactive and additive effects of prior thermal discharges were to be considered. EPA also provided that even with prior appreciable harm, it would consider an alternative standard upon demonstration that the substitute would protect waterlife. Admissible evidence supporting either of these

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[72] U.S., Congress, House, Public Works Subcommittee on Investigations and Review, Hearings on the Steam Electric Power Generating Point Source Category, 93rd Cong., 2nd sess., 1974, passim.

[73] 39 Fed. Reg. 36176 (1974). [74] Ibid.

[75] The following description of the three alternatives relies on 39 Fed. Reg. 36181 (1974).

claims included data from the applicant's prior operation of the plant, as well as proof of the facility's compliance or noncompliance with previous state water quality standards.

A second method for justifying an alternative standard required proof that "representative, important" fish species in each receiving body of water would be protected and allowed to propagate. To qualify for this designation a species would have to be classified as essential, in terms of biological needs, for maintaining a balanced, indigenous aquatic community. Evidence supporting an operator's claim for an alternative standard would have to demonstrate that thermal discharges from the plant would comply with all water quality criteria developed by EPA pursuant to Section 304 of the Act dealing with "growth, reproduction, and survival" of designated species.

The final exemption method specified by EPA was one designed for plants that had no previous record of operation. Again the goal was to protect and ensure the propagation of a balanced, indigenous community of aquatic life. This alternative provided, however, that absent actual plant operating data, an operator could submit biological and engineering models of anticipated effects to bolster exemption arguments. Allowable supporting documentation included extrapolations from the operations of comparable polluting sources based on new or historical biological data and physical monitoring, as well as the results of engineering and diffusion modeling.

Thus did EPA come to grips with the imprecise intent of Congress to allow pollution variances to individual sources of thermal discharge.

For reasons to be discussed in subsequent chapters, the agency's translation of Section 316 into these substantive program directives proved highly significant to TVA during the 1970's. Indeed, EPA's interpretation would effectively dash any hope the federal utility might harbor for obtaining immediate relief from stringent, and hence very costly, thermal standards during the 1970's.

Discussion

The preceding has described the process and substance of, as well as the issues involved in, three basic decisions EPA had to make before it could apply the CAA and FWPCA to the Tennessee Valley Authority. In each case these concerned the strictness of standards, the specification of pollution control techniques, and the determination of regulatory targets. Several points of comparison merit discussion. First, in both cases EPA's interpretation of what constituted standards adequate to protect the environment was challenged. The bases of the challenges, however, were somewhat different for the two. Thermal standards were debated on the basis of technical considerations. That is, what amount of heat, in what concentrations, and over what period of time really harmed different species of fish, at different life stages, and under what climatic conditions. Never salient was the question of whether excessive heat discharge was really responsible for aquatic ecosystem damage. This was a well-documented, widely accepted scientific fact. In contrast, standards promulgated for SO_2 were challenged on more than mere technical bases; EPA still struggled to prove the more basic

threshold question of whether the substance, in and of itself, was really harmful at all.

Secondly, while EPA's substantive interpretation of the appropriate technological fix for meeting the requirements of each act would invite controversy, the bases for challenge again differed. Certainly, both scrubbers and closed-cycle cooling tower systems were challenged for environmental problems incidental to their operation. In the case of the former, large quantities of limestone sludge produced during "scrubbing" caused significant waste disposal problems. And cooling towers were assailed for creating inordinate amounts of fog, heavy icing, and sudden weather modifications. But the two technologies were worlds apart in terms of the amount of agreement each engendered concerning their respective abilities to perform assigned tasks. While disagreement reigned over what kind of cooling tower (natural-draft, mechanical-draft, wet or dry) or what mode of operation (open, closed, or combined) was appropriate for each site, once towers were installed to meet a particular temperature standard, that standard would invariably be met. In contrast, scrubbers were an essentially untried, unproven technology for eliminating SO_2 emissions; and their efficacy was particularly in doubt at large (i.e., 1000 mw) power plants such as those operated by the TVA. They were also much more costly than their more proven alternative: the intermittent control system/tall stack strategy.

Thirdly, it is worthy of note that while both the CAA and the FWPCA incorporated clauses dealing specifically with the obligation of federal

facilities such as TVA to comply with air and water quality requirements, only in the case of the CAA did this obligation become a major issue. Recall that the FWPCA gave EPA the authority to implement the discharge permit program, while the CAA delegated the operation of its implementation program to the states. When most states adopted a permit system as their primary enforcement tool, federal facilities challenged whether they had to comply with state permitting procedures, premising their argument on the Supremacy Clause of the Constitution. Such a challenge—whether principled or merely dilatory—was never mounted by federal facilities in regard to the FWPCA.

Fourthly, significant differences between the cases existed in regard to the number and tenacity of challenges to EPA's interpretation efforts. Using as a forum the Quality of Life Review Process that institutionalized their role in formulating environmental policy, agencies such as the FPC, FEA, and the Commerce Department raised persistent challenges in a variety of congressional and executive branch settings to EPA's interpretation of the CAA. Moreover, private sector actors such as the American Electric Power Company mounted multimedia blitzes assailing EPA's implementation efforts. In contrast, EPA's interpretation of the FWPCA was marked by discussion throughout the months of public comment and public hearings sponsored by the agency. But never were its efforts assailed by its sister agencies or by private sector actors in so contentious a manner, nor with such unrelenting zeal, as characterized its interpretation of the CAA.

Finally, the manner in which EPA interpreted provisions of the CAA and FWPCA differed substantially. The agency's tortuous two and a half

year struggle to resolve the constant versus intermittent control system question pursuant to the CAA was unparalleled during its interpretation of technology-based effluent limits under the FWPCA. Also absent in the case of the latter were statements analogous to those made by Administrator Ruchelshaus that SO_2 standards were premised on data that failed to definitively document their relationship to health hazards.

With these similarities and differences in mind, it is now appropriate to turn to the specifics of EPA's application efforts in the EPA/TVA cases. Chapter IV will thus chronicle the events, personalities, and factors associated with EPA's application of SO_2 and thermal pollution control requirements as they affected the operations of the TVA power program during the 1970's. Because the interpretation and application activities of implementation are analytical distinctions, tending in reality to occur concurrently, much of what has been said in this chapter will be referred to in the next. Interpretational experiences will thus provide a context for examining the specifics of EPA's two application efforts, as well as TVA's two very different responses to them.

CHAPTER IV

FROM COMPLACENCE TO COMPLIANCE: APPLYING THE CAA AND FWPCA TO THE TENNESSEE VALLEY AUTHORITY

It has been argued that "enforcement of a social preference is typically essential if the preference is to be realized."[1] Thus far this study has examined aspects of the implementation of two rather significant "social preferences" as they related to the Tennessee Valley Authority: the Clean Air Act and the Federal Water Pollution Control Act. Examined have been two of the three sets of activities reputed by Charles O. Jones to be most significant during implementation: the establishment of units and methods for carrying out policy (organization) and the translation of statutory language into acceptable, feasible directives (interpretation). Chapter II presented a description and comparison of the organizational infrastructure provided by the CAA and FWPCA for effecting SO_2 and thermal pollution control respectively. In Chapter III the substance and process of, as well as the issues involved in, EPA's interpretation of those aspects of the two acts relevant to the operations of TVA's power program were compared and contrasted.

With this as background, it is now appropriate to turn to the critical enforcement dimension of the policy process—what Jones might term the application activities of implementation. This chapter deals

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[1]William H. Riker and Peter C. Ordeshook, An Introduction to Positive Political Theory (Englewood: Prentice-Hall, 1973), p. 5.

with the particulars of EPA's implementation experiences with the TVA in regard to SO_2 and thermal pollution control in the Tennessee Valley. Specifically, it examines the interaction between the two agencies as the EPA sought to apply (i.e., enforce) its interpretations of the CAA and FWPCA to the federal facility. To allow appreciation of the two cases from the perspective of TVA, a brief history of the development of its power program introduces the chapter. This is followed by a review of the two implementation controversies under study. The chapter concludes by highlighting the major differences between the two cases.

The Development of the TVA Power Program

Since its creation in 1933, the Tennessee Valley Authority has been involved in the production and transmission of electrical power. The size of the TVA power program has expanded enormously over the years, however, to the point where it is today the nation's largest producer of electricity. This development is attributable to the magnitude of the agency's responsibilities under the TVA Act, the scope of the problems it was called upon to address, and the ideology of the individuals appointed to direct its activities.

The TVA Act of 1933 charged the agency with implementing a resource development program conceived on a scale never before attempted. For a region where per capita income was 44 percent below the national average, Congress sought the "economic and social well-being" of its inhabitants through TVA's encouragement of agricultural and industrial development.[2]

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[2]U.S. Statutes at Large, 48 Stat. 58.

And President Roosevelt sought the embodiment of one of his most cherished goals: public power production.[3] The President felt that private utilities were discouraging economic development by charging exorbitant rates for electricity. Roosevelt's solution was to have a government utility produce electricity at rates reflecting the "true cost" of power production. In essence, a government utility would "regulate by example," serving as a "yardstick" against which private utilities would ultimately be measured.[4] Roosevelt's desire was to have TVA be such a yardstick.

Consistent with Roosevelt's vision of the agency as "a corporation clothed with the power of government but possessed of the flexibility and initiative of a private enterprise," the organization, policies, and programs for realizing these ambitious goals were left to the discretion of the TVA Board of Directors.[5] The three-member Board was to be appointed by the president, with the advice and consent of the Senate, to nine-year, overlapping terms. One of the three members would be designated by the president as chairman. Together these three would assume policy-making responsibility for the agency with no provision made for representation of, or oversight by, representatives of its seven-state service area.

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[3]For a discussion of Roosevelt's public power philosophy see David H. Davis, Energy Politics, pp. 146-149.

[4]For a discussion of Roosevelt's "yardstick" philosophy see Thomas K. McCraw, TVA and the Power Fight: 1933-1939 (New York: J. B. Lippencott Company, 1971), pp. 33-34.

[5]House Doc. 15, 73d Cong., 1st sess. (1933).

In 1933 the TVA Board of Directors voted to divide operating authority for the agency among themselves.[6] Responsibility for the power program was given to David Lilienthal, a man who some say brought "a missionary devotion to [Roosevelt's] New Deal ideology" to the agency.[7] One of Lilienthal's first and most critical decisions involved making TVA an independent, principal supplier of electricity for the region.[8] To do this, and in the process perform the yardstick function so cherished by Roosevelt, TVA would have to develop a system for distributing the low-cost hydroelectric power generated as a by-product of its high dam flood control projects. Lilienthal set about immediately to expand the size and scope of the agency's power production and distribution system. By accelerating dam construction and buying out private utilities, he nearly tripled the size of TVA's generating capacity between 1933 and 1939.[9] To distribute electricity he established a two-tier system, with TVA selling power directly to industrial users while contracting with municipalities and rural cooperatives to retail power to nonindustrial consumers. Guaranteed to arouse the ire of private utilities, TVA refused to enter into cooperative pooling

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[6]For a fascinating account of the events surrounding this decision see Callahan, TVA: Bridge Over Troubled Waters, Chap. 2.

[7]Davis, Energy Politics, p. 152.

[8]See Thomas K. McCraw, Morgan vs. Lilienthal: The Feud within TVA (Chicago: Loyola University Press, 1970).

[9]George E. Rawson, "The Process of Program Development: The Case of TVA's Power Program" (Ph.D. dissertation, The University of Tennessee, Knoxville, 1978), p. 53.

arrangements with the privates. Even more distressing to them, TVA was able in some instances to produce power at costs up to 70 percent below private utility rates.[10]

So rankled by TVA's attitude and success were the privates that in 1939 alone they filed twelve separate law suits challenging the constitutionality of the agency's power program.[11] By 1939, TVA had successfully weathered this onslaught. What is more, through its contractual commitments to consumers and distributors, as well as its purchase of private utilities, it was firmly established as the sole supplier of electricity to major portions of the Tennessee Valley. In the process TVA, in effect, committed itself to meeting whatever power demands Valley consumers could place upon it.

It was not long before the Valley's electricity demands exceeded the ability of TVA's hydroelectric system to meet them. The lure of the agency's low-cost electricity and its success in rural electrification combined to force the agency to increase its generating capacity five-fold between 1939 and 1945.[12] After an influx of energy-intensive industrial and government facilities during and after World War II, officials began to doubt the capacity of the hydropower system to meet consumer demands in the foreseeable future. The TVA Board turned to the abundant, inexpensive coal supplies of its native Appalachia to meet the

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[10]Callahan, TVA: Bridge Over Troubled Waters, p. 56.

[11]Rawson, "TVA's Power Program," p. 50.

[12]Ibid., p. 58.

impending crisis. In 1948 TVA moved to install coal-fired steam plants to supplement its hydropower facilities.[13] Unlike private utilities, TVA did not have to obtain permission from state regulatory commissions before proceeding with the installation of these plants. But it did have to obtain congressional authorization and appropriations for doing so at that time. Congress, propelled by its Democratic majority, disallowed private utility objections and funded the construction of the agency's first steam plant in 1949. Subsequent authorizations for additional plants followed over the next two years.

With the Eisenhower victory of 1952, support for further increases in TVA's generating capacity waned. When funding for additional coal-fired plants was requested by the agency, a more conservative, more Republican Congress balked, thus precipitating the famous Dixon-Yates controversy.[14] At a time when the "production and sale of power had come to dominate program action if not program thinking," TVA officials were caught between the seemingly insatiable power appetite of a rapidly industrializing Valley, and the long-term promise of a Congress unsympathetic to its needs and mission.[15] TVA sought an alternative funding

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[13]U.S., Congress, House, Testimony of Gordon Clapp before the Subcommittee of the Committee on Appropriations, Government Corporations, Appropriations Bill for 1949, 80th Cong., 2d sess., 1948, pp. 422-423.

[14]The best discussion of the Dixon-Yates case is presented in Aaron Wildavsky, "TVA and Power Politics," American Political Science Review 55 (September 1961): 576-590.

[15]Roscoe C. Martin, "Retrospect and Prospect," in TVA: The First Twenty Years, ed. Roscoe C. Martin (University: University of Alabama Press, 1956), pp. 266-267.

scheme for its power program, and in 1958 the TVA Act was amended to permit the agency to finance power program expansion by selling bonds to the public. Free from birth from state regulation, TVA was now "technically free" from congressional and presidential scrutiny as well.[16]

By 1965, the provision of low-cost, coal generated electricity in sufficient quantities to satisfy the needs of Valley consumers dominated TVA's program action and thinking. Eighty percent of the agency's total generating capacity was coal-fired; and power program expenditures in 1966 accounted for almost three quarters of TVA's total budget.[17] Furthermore, Board Chairman Aubrey Wagner would characterize the TVA philosophy as "having the basic premise . . . that low electric rates encourage high levels of use, which in turn contribute importantly to an improved economy."[18] In that same year, however, obtaining coal for TVA plants became more problematic, more expensive, and more environmentally controversial. Thus, as coal supplies dwindled, as environmentalists attacked its use of strip-mined coal, and as TVA officials projected a one million kilowatt per year increase in electricity consumption, the agency announced plans to build a nuclear power plant and locate it in Alabama.[19] This was followed in 1967 by its announcement

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[16]"TVA Revenue Bonds," Congressional Quarterly Almanac (Washington: Congressional Quarterly, Inc., 1959), p. 261.

[17]Rawson, "TVA's Power Program," p. 71.

[18]U.S., Congress, Senate, Subcommittee on Flood Control-Rivers and Harbors of the Committee on Public Works, Increase in Statutory Limitation of TVA to Issue Bonds, 89th Cong., 2d sess., 1966.

[19]Rawson, "TVA's Power Program," p. 87.

that a second nuclear plant would be built, this time in Tennessee.[20] Known as Browns Ferry and Sequoyah respectively, these two plants were but the beginning of what was envisioned the world's most substantial commitment to nuclear power production.

The power projections issued by TVA in 1970 reflect the depth, as well as the perils, of the agency's nuclear commitment.[21] Officials anticipated that while coal plants accounted for nearly 80 percent of TVA's 1970 power generating capacity, they would provide less than 35 percent of its total in 1985. In contrast, while nuclear plants contributed not at all to TVA's power generating capacity in 1970, they would be responsible for nearly 55 percent of its total in 1985. To this end, the agency prepared to phase out several of its older coal-fired plants and let out bids for twelve nuclear units at five additional plants to be built during the 1970's. By de-emphasizing coal-fired power plants, and pursuing the nuclear option to the degree that it anticipated, TVA proposed to link its success in meeting the spiraling power demands of the Tennessee Valley to its ability to get nuclear units into operation on schedule.

To review, what had begun in 1933 as a small-scale power program had by 1970 become the largest in the nation; one essentially immune from congressional oversight and state regulation. In the process, and consonant with its New Deal "yardstick" philosophy, TVA's power program

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[20] Ibid.

[21] Tennessee Valley Authority, Tennessee Valley Authority Power Annual Report (Knoxville, TVA, 1970-1971).

thinking and activities repeatedly reflected its commitment to producing power at the lowest cost possible to meet the needs of its Tennessee Valley service area. Faced with spiraling service demands that outstripped its hydropower capabilities, the agency turned first to coal-fired steam plants as the most cost-effective method of meeting its responsibilities. Later, when it perceived that hydro and coal power generation would prove insufficient for the needs of the seventies and eighties, TVA took steps to increase its reliance on presumably less costly, more reliable, and less ecologically threatening nuclear power generation. As the agency prepared to phase out older coal-fired plants and bring its nascent nuclear contingent on-line during the 1970's, it would draw the sustained attention of the Environmental Protection Agency as the latter sought to implement two major components of the new social regulation. In the process, according to one TVA official, the agency would have to "learn how to survive as a regulated agency."[22]

The SO_2 Pollution Control Dispute

The EPA/TVA dispute over SO_2 pollution control was a prolonged, bitterly contested struggle; one that still rankles many of those who participated in, or are affected by, its resolution. Before EPA could settle its differences with the TVA and thus apply its interpretation of the CAA of 1970 to that agency's operations, three fundamental issues had to be addressed. First, were TVA's coal-fired steam plants required

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[22]Memorandum from Robert H. Marquis, TVA General Counsel, to John Barron and F. E. Gartrell, August 10, 1973.

to install constant, rather than intermittent, SO_2 control systems? Second, was the TVA as a federal facility required to meet the procedural, as well as the substantive, directives issued by Alabama, Kentucky, and Tennessee for abating SO_2 pollution? And finally, what was the most effective, legally appropriate way for EPA to expedite TVA compliance? These questions would be debated within EPA itself, among various executive branch agencies, within the Executive Office of the President, before Congress and the federal judiciary, within the states, and in the arena of public opinion. In the end the most expensive environmental clean-up settlement in history would be reached, but only after a determined, very nearly successful series of TVA challenges to EPA's application efforts.

Toward the Dispute

Recall that in the early 1970's, TVA was initiating a major transition in its power program. Perceived as the only viable option for meeting the power demands of the Tennessee Valley in the 1980's, drastic reduction of TVA's dependence on coal for electricity generation animated program thinking and action. Agency plans called for the phasing out of several of its older coal-fired plants during the decade as seventeen new nuclear units at seven plants came on-line to meet spiraling electricity demands. Anticipated along with the reduction in coal burning was a concomitant reduction of the SO_2 emissions normally produced by these coal-fired plants. And this in turn peaked agency expectations that the rising crescendo of environmentalist attacks excoriating TVA as the nation's most prolific—and the federal

government's most embarrassing—source of SO_2 pollution would diminish as well. But because TVA intended to reduce, not eliminate, its coal generating capacity, the agency would still have to cope with the CAA of 1970 as it related to the control of SO_2 pollution. As a consequence, TVA would initiate a determined campaign to garner external support for its perspective on what adequate compliance with that law should be.

TVA began its campaign in late 1970. At that time the air pollution control boards of Alabama, Kentucky, and Tennessee were holding hearings on the implementation plans (SIP's) that they would have to submit to EPA for approval. TVA was naturally concerned with what SO_2 compliance strategies the states would allow since it hoped to gain approval for its own plan; one that the agency felt would reconcile most inexpensively environmental concerns and its own plans to reduce coal generating capacity. Known popularly as SDEL, this plan was premised on an intermittent control system strategy (ICS). It had three components: increasing the height of plant smokestacks to disperse SO_2 downwind of TVA facilities thus diluting, rather than reducing, actual emissions; temporary shutdowns of plants when SO_2 concentrations were too heavy; and interim burning of low-sulfur coal when health hazards existed.[23]

TVA adroitly used the state hearings to promote the virtues of ICS-based strategies as opposed to their most popular alternative: constant control systems that combined the continuous use of scrubbers

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[23]U.S. Environmental Protection Agency and the Tennessee Valley Authority, EPA/TVA Joint Task Force Report.

and low-sulfur coal to reduce SO_2 emissions.[24] Agency officials argued that only intermittent controls would allow its plants to meet national ambient air quality standards (NAAQS) by statutory deadlines, and that constant controls were economically and technologically infeasible in the immediate future. While TVA's arguments were persuasive to the Tennessee and Kentucky boards—they proposed SIP's in 1971 that allowed ICS strategies—Alabama refused to allow TVA's approach. The issue was now placed squarely before the EPA. As the agency prepared to review SIP provisions for approval or disapproval, it was under feverish pressure from environmental groups to disallow ICS as a control strategy. These groups insisted that Congress intended the reduction and not merely the dilution of SO_2 emissions, and therefore only constant controls were acceptable. In this fashion were the battlelines of the EPA/TVA dispute distinctly drawn.

The Dispute Is Joined

As previously recounted, EPA's interpretation of the control strategy question took a tortuous, vacillating path. After EPA avoided the question in promulgating approved SIP's in May 1972 and then proposed regulations disallowing intermittent controls two months later, TVA prepared to plead its case once more before the states and at national hearings sponsored by EPA. Before actually doing so, however, it would

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[24] See U.S., Congress, Senate, Testimony of Richard E. Ayres before the Subcommittee on Air and Water Pollution of the Committee on Public Works, Hearings on the Implementation of the Clean Air Act Amendments of 1970. Part I. 92d Cong., 2d sess., 1972, p. 19.

show its displeasure with—and some would say its disdain for—having to obtain state permits to operate its plants. TVA, questioning the constitutionality of a federal agency having to meet procedural requirements of the states, refused to apply for these permits. EPA, environmental groups, and the states felt, however, that if TVA were exempted from state permit requirements, it would be exempted from state enforcement of emission limitations as well. Consequently, Alabama and Kentucky filed separate suits in the fall of 1972 to require TVA to apply for permits to operate coal plants located within their boundaries.[25]

With its position on state permits pending before federal judges in two circuits, and with EPA proposing to disallow intermittent controls, TVA resumed its public offensive. In late 1972 Board Chairman Aubrey Wagner strongly attacked constant control systems in a widely publicized speech in New Orleans.[26] Wagner cited their excessive costs and unproven capabilities. He alleged as well that the "sludge" produced by scrubbers posed substantial environmental problems. The same theme was repeated throughout 1973 by TVA representatives, but with one significant variation: now the emission limitations of the states were attacked as infeasible as well. First enunciated in the spring when the agency submitted compliance plans to the states asking for exemption from SO_2

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[25] Alabama v. TVA, No. 72-939 (N.D. Alabama, 1972) and Kentucky v. Ruchelshaus, No. 74806 (N.D. Kentucky, 1972).

[26] Chairman Wagner's speech was reproduced in U.S., Congress, House, Testimony of Aubrey J. Wagner before the Subcommittee of the Committee on Appropriations, Hearings on Public Works for Water and Power Development and Research Appropriation Bill, 1976, 94th Cong., 2d sess., 1976, pp. 13-16.

emission limitations and approval of its SDEL program, TVA's litany of charges was repeated during testimony at national scrubber hearings sponsored by the EPA in October.[27] These efforts were supplemented by TVA publications and news releases appearing throughout the year extolling the agency's past and prospective pollution control activities.

Two events occurred in the fall of 1973 to buoy TVA's optimism that its position on intermittent controls might yet prevail. In September, EPA reversed its position of a year earlier and now proposed a regulation allowing intermittent controls. This was followed in October by the OPEC oil embargo, a catalyst for the most severe onslaught yet to EPA's interpretation of the Clean Air Act. Confronted by embargo-induced energy shortfalls and economic recession, many federal government agencies concerned with energy supplies and commercial development began denouncing environmental regulations for their presumed capacity to frustrate energy production and business growth. As noted in Chapter III, several agencies took advantage of the Quality of Life Review Process to formally challenge EPA's interpretation efforts. Accompanying this barrage were well-orchestrated, elaborately financed antiscrubber lobbying and advertising campaigns financed by such private business interests as the American Electric Power Company.

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[27] Environmental Protection Agency, Report of the Hearing Panel, National Public Hearings on Power Plant Compliance with Sulfur Oxide Air Pollution Regulations, January 1974. TVA's presentation was likely, in part, a response to the EPA's call for "demonstration by each candidate source on a case-by-case basis that adequate constant emission reduction techniques are not available to attain and maintain the national standards, and that those techniques that are available would be applied to permanently reduce emissions to the maximum extent practicable prior to application of supplementary control systems." See 38 Fed. Reg. 25699 (1973).

In response to these pressures, EPA invited the states in late 1973 to eliminate from their implementation plans overly stringent provisions that might exacerbate fuel shortages.[28] Tennessee and Alabama responded by proposing an increase in allowable SO_2 emission limits in the vicinity of TVA plants.[29] Kentucky proposed to allow intermittent controls.[30] EPA would not rule on the acceptability of these provisions until August 1974. At that time its decision to disallow the proposals would lead to EPA's first official notification to TVA that it was violating the Clean Air Act. But in the interim—with emission limits and compliance strategies still in doubt—TVA initiated negotiations with EPA on these matters. Meeting in April 1974, Chairman Wagner and the EPA administrator established a joint agency task force to produce a document juxtaposing respective agency positions on air pollution control.[31]

The Preliminary Task Force Report issued in June 1974 produced few surprises in terms of TVA's position: only SDEL would allow TVA to meet national SO_2 standards by the 1975 deadline; if the CAA did not allow intermittent controls—as TVA argued it clearly did—then the Act should be amended; insufficient scientific evidence existed linking SO_2 emissions

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[28] U.S. Environmental Protection Agency and the Tennessee Valley Authority, EPA/TVA Joint Task Force Report, p. 4-4.

[29] 38 Fed. Reg. 34476, 34477 (1973).

[30] 39 Fed. Reg. 10277 (1974).

[31] Letter from Russell Train, EPA Administrator, to Aubrey J. Wagner, TVA Board Chairman, May 24, 1974, as presented in the EPA/TVA Joint Task Force Report, p. 1-3.

to health hazards if ambient standards were met; and EPA had indicated its approval of intermittent controls once already. EPA Region IV representatives took issue with TVA's points. Aside from endorsing the economic and technological feasibility of constant controls, the Region IV staff also made several other points: constant controls were mandated by the CAA; SDEL was an unproven approach to pollution control that might jeopardize public health; and Valley power shortages could result when temporary plant shutdowns were needed to combat excessive SO_2 concentrations. Interagency talks continued until January 1975 when a final, basically identical report was issued.

While the task force discussions were taking place, two events transpired to induce a swift hardening of negotiating positions. First, TVA's refusal to apply for state permits to operate its plants received external support from a federal court in the 6th Circuit. The court decided that TVA did not have to apply for such a permit, but had only to conform with the SO_2 standards and limitations contained in Kentucky's implementation plan.[32] Then a 5th Circuit court would rule less than a month later that TVA did have to apply for a permit in Alabama.[33] These offsetting opinions gave the agency respite from state enforcement efforts while the decisions were appealed to the Supreme Court.

The second event having a chilling effect on the talks resulted from EPA's decision in August 1974 to disallow the intermittent control

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[32] Kentucky v. Ruchelshaus, 497 F 2d 1172 (6th Cir., 1974).

[33] Alabama v. Seeber, 502 F 2d 1238 (5th Cir., 1974).

provision proposed by Kentucky to reduce "overkill" in its SIP.[34] With task force negotiations at an impasse, and with TVA convinced that the Kentucky decision was a harbinger of future EPA policy, TVA filed suit challenging EPA's authority to disapprove state provisions permitting intermittent controls.[35] One week after TVA filed suit, EPA officially notified the agency that ten of its twelve plants were in noncompliance with the ambient air standards of Alabama, Kentucky, and Tennessee.[36] Then in November and December, it promulgated regulations that in effect disallowed TVA's SDEL strategy. TVA would make no effort to comply at this time; and EPA would do nothing more than continue negotiating with the agency.

Narrowing TVA Options

The period between early 1975 and 1977 saw several developments in the scope and process of the EPA/TVA dispute. First, the antiregulation mood in Washington intensified as economic stagflation persisted. Second, both TVA and EPA stepped up their congressional lobbying efforts in anticipation of amendments to the Clean Air Act. Third, Supreme Court decisions relevant to the dispute brought EPA and TVA back to the negotiating table as EPA frustration with, and animosity toward, TVA

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[34] 39 Fed. Reg. 29357 (1974).

[35] This suit was subsequently decided in Big Rivers Electric Corp. v. EPA, 523 F 2d 16 (1975).

[36] William R. Shaw, "Procedures to Ensure Compliance by Federal Facilities with Environmental Quality Standards," 50216.

spiraled. Fourth, an enforcement rift developed between EPA headquarters, EPA Region IV officials in Atlanta, and the Department of Justice. And finally, citizen group interest in the dispute took on added intensity and importance. While some of these would help, and others hinder, EPA's application of the Clean Air Act to the TVA, the latter's compliance options would be severely circumscribed by the end of this time period.

As the final EPA/TVA task force report was issued in January 1975, and as President Ford was submitting to Congress the ill-fated Department of Commerce amendments to the CAA making intermittent controls an acceptable compliance strategy, TVA stepped up its antiscrubber campaign. While opening the full range of agency activities to the scrutiny of its "friends" and "foes" to a degree unprecedented in recent history, TVA officials nonetheless made numerous appearances before congressional committees to proselytize their position on constant control systems.[37] Repeatedly that spring, they would make the case for intermittent controls and implore acceptance of the Ford amendments. Moreover, they took advantage of the first TVA oversight hearings since the late 1930's to attribute spiraling electricity rates, in part, to environmental regulations. Hitting a responsive chord in both Washington and the Tennessee

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[37] See, for example, U.S., Congress, House, Testimony of Nathaniel B. Hughes, Jr., TVA Asst. Power Manager, before the Subcommittee on Health and the Environment, 94th Cong., 1st sess., 1975, pp. 773-774; U.S., Congress, Senate, Committee on Public Works, TVA Oversight Hearings, 94th Cong., 1st sess., 1975; U.S., Congress, Senate, Public Works Subcommittee on Environmental Pollution, Hearings on the Implementation of the Clean Air Act of 1970: Proposed Amendments, 94th Cong., 1st sess., 1975; and U.S., Congress, House, Committee on Appropriations, Hearings on Public Works for Water and Power Development and Energy Research Appropriation Bill, 1976, 94th Cong., 1st sess., 1975.

Valley service area, Wagner carried this theme directly to the EPA administrator in May 1975. The Chairman advised that the TVA Board would not "in good faith" commit Valley consumers "to pay the high costs of scrubbers and low-sulfur coal" before the federal facility and intermittent control issue were resolved by the courts or the Congress.[38]

Movement on the judicial front began in September 1975 as the 6th Circuit delivered a powerful blow against TVA's intermittent control strategy. Ruling on TVA's 1974 suit challenging EPA's authority to disallow provisions of Kentucky's implementation plan allowing intermittent controls, the court affirmed EPA's right to do so.[39] Pursuant to this decision, and as TVA appealed the ruling to the Supreme Court, EPA issued tall stack guidelines in March 1976 that in effect disqualified most TVA plants from installing intermittent control technology.[40] TVA's quest for judicial relief on this issue ended abruptly in April of that year when the Supreme Court refused to hear its appeal.[41] This decision was followed in June by another Supreme Court ruling that supported TVA's federal facility compliance position, albeit in a less than enthusiastic manner.[42] In finding that the agency had to meet SO_2 emission standards

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[38]Tennessee Valley Authority, "Chronology of TVA Sulphur Dioxide Control."

[39]Big Rivers Electric Corp. v. EPA, 523 F 2d 16 (1975).

[40]41 Fed. Reg. 7450 et seq. (1976).

[41]Big Rivers Electric Corp. v. EPA, Crt. Denied, 425 U.S. 934 (1976).

[42]Hancock v. Train, 425 U.S. 167 (1976).

and limits, but that it did not have to apply to the states for operating permits, the Court noted the ambiguity of Section 118 and encouraged clarification of the federal facility issue by Congress.

As these court decisions were announced, citizen groups in the Tennessee Valley began to focus their attention on what many perceived as TVA's indifference to, if not hostility toward, environmental concerns. Intensive citizen scrutiny of TVA operations began with a series of symposia sponsored by the Tennessee Environmental Council. Entitled "TVA and the Environment," the symposia featured representatives of TVA and EPA, as well as noted energy, environmental, and legal experts.[43] Each symposium featured a different aspect of TVA's operations and brought together individuals who would later play key roles in resolving the SO_2 dispute. For example, S. David Freeman would later become a prime mover in negotiating the clean air settlement as a member, and subsequent chairman, of the TVA Board of Directors. Paul Traina would lead the negotiating team for EPA Region IV during those same talks. And the Tennessee Environmental Council, led by director Ruth Neff, would spearhead a coalition of citizen groups that would file suit against TVA for noncompliance with the Clean Air Act.

In June 1976, in the wake of the Supreme Court's denial of certiorari in the intermittent control case, TVA hoped to get its now discredited views incorporated as amendments to the Clean Air Act. In the interim,

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[43] Interview with Dr. Ruth Neff, Tennessee Environmental Council, Nashville, Tennessee, November 7, 1979; interview with Ms. Mary Wade, Tennessee League of Women Voters, Nashville, Tennessee, November 7, 1979.

the agency again initiated talks with EPA, promising to meet all SO_2 standards "as rapidly as possible."[44] It also sought to qualify four of its plants for exemptions under the recently enacted EPA tall stack guidelines. When TVA failed to submit a revised compliance strategy by the deadline it had promised to meet, however, EPA issued its second notice of SO_2 violations to the agency.[45] As with the first, issued two years prior, EPA did not resort to its primary enforcement sanctions: shut-down of TVA's noncomplying plants or court suits against the agency. Instead, it continued negotiations with TVA, a choice that would incur severe criticism and reveal several deficiencies in the EPA enforcement arsenal.

EPA's decision to continue talks with TVA came under heavy criticism from environmentalists who accused the agency of "dragging its feet," when faced with noncompliance by its sister agency.[46] The comments of one Region IV official on this matter are quite revealing: "We were caught in the middle between the environmentalists and the TVA."[47] Other EPA officials suggested some of the reasons for the agency's enforcement dilemma. Several suggested that the threat of closing TVA plants was never a credible one given the disastrous socioeconomic dislocations such

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[44] Tennessee Valley Authority, "Chronology of TVA Sulphur Dioxide Control," p. 3.

[45] Ibid.

[46] Interviews with Attorney Dean Hill Rivkin, U.T. Law School, Knoxville, Tennessee, December 4 and 17, 1979.

[47] Interview with Mr. Jack Raven, EPA Region IV Administrator, Atlanta, Georgia, June 28, 1980.

an action would engender for Valley states.[48] Others maintained that there existed a debilitating split both within EPA, and between EPA and the Justice Department, over whether or not it was legally appropriate for the agency to file suit against TVA for noncompliance.[49] And finally, some indicated that EPA felt overwhelmed when negotiating with TVA's widely heralded air pollution staff: "Hell, [TVA] was the international expert on scrubbers; we weren't always sure we were doing the right thing . . . their arguments [for ICS] were sometimes mesmerizing."[50] In spite of these shortcomings, EPA continued to press Congress for amendments that would put TVA's arguments to rest. With the enactment of the CAA of 1977, EPA would realize this goal.

The 1977 amendments were a resounding blow to TVA. After defeating a series of amendments sponsored by Senator Howard Baker that would have exempted virtually all TVA plants from constant controls, the Congress stipulated three things.[51] First, it mandated the use of constant control techniques and specified its intention that SO_2 emissions be reduced, not merely diluted.[52] Second, as the Supreme Court requested, it affirmed

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[48]Interview with Mr. Paul Traina, EPA Region IV, Atlanta, Georgia, June 26, 1980.

[49]Ibid.; interview with Attorney Keith Casto, EPA Region IV Legal Staff, Atlanta, Georgia, June 26, 1980; and interview with Arthur Linton, EPA Region IV, Office of Federal Facility Compliance, Atlanta, Georgia, June 27, 1980.

[50]Traina interview; Raven interview.

[51]Rivkin interview; "Senate Discussion of Baker Amendments," Congressional Quarterly Weekly Report, August 13, 1977, p. 1715.

[52]The Clean Air Act Amendments of 1977, Pub. L. No. 95-95 (1977), Sects. 111 and 123. Henceforth cited as the CAA of 1977.

its intent that federal facilities such as TVA be subject to state permit requirements.[53] And finally, addressing EPA's dismay over the lack of credible enforcement sanctions, it provided market incentives for polluters to comply with the Act.[54] These features included fines that could be offset by the costs of pollution control equipment, penalties based on the economic benefits realized by a polluter while in noncompliance, and reduction of fines when violators cleaned emissions beyond what was required by law.

Reaching a Settlement

During the spring and summer of 1977, as Congress prepared to enact the 1977 amendments, three very important developments began to unfold. Together they would help bring the protracted SO_2 dispute to a close. These included: the filing of a Section 304 citizen suit against TVA by a coalition of public interest groups; the changing of strategic actors at TVA, EPA, and the Justice Department; and the applying of presidential pressure to resolve the dispute.

In January 1977 a coalition of eleven public interest groups distressed by TVA's continuing noncompliance with the Clean Air Act, as well as EPA's "quiet policy" of not taking sister agencies to court for violating the law, was formed.[55] Led by Ruth Neff of the Tennessee

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[53] CAA of 1977, Sect. 118.

[54] CAA of 1977, Sects. 113 and 129.

[55] The citizen groups serving as plaintiff intervenors in the Alabama suit were: Alabama Lung Association, Sierra Club, and Natural Resources Defense Council. The citizen groups serving as plaintiffs in the Tennessee suits were: Tennessee Thoracic Society, East Tennessee Energy Group, League of Women Voters in Tennessee, Natural Resources Defense

Environmental Council, and encouraged informally by several EPA Region IV officials,[56] the coalition issued in March a notice of intent to sue TVA for noncompliance with the Clean Air Act.[57] With this new development as backdrop representatives of TVA, EPA, the states, and the citizen coalition met later that month in Atlanta. At this decidedly adversarial ten-hour confrontation, TVA submitted compliance plans that dropped its prior emphasis on intermittent controls.[58] Proposed instead was the use of low-sulfur coal. To the consternation of EPA, TVA officials also refused to sign a consent agreement prepared by the Region IV staff. TVA, in effect, refused to acknowledge EPA's enforcement power over it. In the words of one Region IV official, TVA in essence was saying, "Who do these people [EPA Region IV] think they are telling us what to do?"[59] Region IV officials left the heated meeting feeling betrayed, insulted, and determined to file suit against TVA.[60] But these officials would soon meet the determined resistance of both EPA headquarters and the

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Council, Save Our Cumberland Mountains, Sierra Club, Tennessee Citizens for Wilderness Planning, Tennessee Environmental Council, and Vanderbilt Environmental Group.

[56]Traina interview; Marvin Durning, soon to become the EPA Deputy Administrator for Enforcement, also contacted Attorney Rivkin at this time and indicated his interest in, and support for, the citizen suit; Rivkin interview.

[57]Rivkin interview; Neff interview.

[58]The adversarial tone of this meeting was alluded to by several interviewees including Attorneys Rivkin, Casto, and Walton.

[59]Traina interview.

[60]Ibid.; Casto interview; interview with William Chandler, Environmental Policy Center, Washington, D.C., January 28, 1980.

Justice Department in this quest. For those officials who "had been in the trenches with TVA," morale was at an all-time low.[61] A turnabout in this situation would soon transpire, however, as the new Carter Administration began to make its presence felt in the dispute.

The impact of the Carter Administration began, albeit indirectly, in 1977 with the President's State of the Union message.[62] In that speech, Carter announced his intention to see the TVA become an energy and environmental "yardstick" for the nation. Then in July of that year, shortly after the citizen suit was filed, a vacancy occurred on the TVA Board of Directors. After soliciting the advice of environmentalists,[63] Carter appointed TVA critic S. David Freeman to the position on the three-member Board. This was followed in August by his appointment of Marvin B. Durning as Deputy Administrator for Enforcement at EPA.

S. David Freeman, reflecting Carter's views, felt that TVA had to be a leader in showing the private sector how to reconcile energy and environmental concerns.[64] The best way to do this according to Freeman was not to encourage consumption of electricity by maintaining artificially low rates as TVA had historically done to encourage economic development. Rather, Freeman felt that energy conservation made possible

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[61] Traina interview.

[62] New York Times, May 26, 1977, p. 14, 1.

[63] Rivkin interview.

[64] Interview with Mr. S. David Freeman, Chairman, TVA Board of Directors, Knoxville, Tennessee, December 30, 1980. Also see U.S., Congress, Senate, Committee on Environment and Public Works, Hearings on the Nomination of S. David Freeman, 95th Cong., 1st sess., 1977, pp. 60-70.

by internalizing the true costs of production—especially the environmental costs—was the long-term solution for reconciling such values. The EPA appointee, Marvin Durning, was said to have "brought life" to that agency's enforcement effort, coming to Washington with a "hit list" of polluters that made TVA his number one enforcement target.[65] Moreover, in contrast to his predecessors, and to the delight of regional EPA officials, he indicated his willingness to prosecute federal facilities who remained in noncompliance with clean air laws.[66] Emphasizing the depth of his commitment to this litigation philosophy, Durning immediately proposed that EPA "run like hell to catch up with the citizen groups" by joining their law suit and by offering the agency's technical support to their challenge.[67]

The two Carter appointees also shared a similar philosophy about TVA's role as a public agency. Each felt that TVA was, as a member of the federal family, "more than just another power company"; it was a social agency with a social purpose and the holder of a public trust.[68] Consequently, TVA ought not wait until ordered by a court to conform to the law of the land; rather, it had a moral, as well as a legal, duty to

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[65]Traina interview; interview with Mr. James Bycott, EPA Region IV Attorney, Atlanta, Georgia, June 29, 1980; and interview with Mr. Charles Hungerford, EPA Staff Attorney, Washington, D.C., January 28, 1980.

[66]U.S., Congress, Senate, Committee on Environment and Public Works, Hearings on the Nomination of Marvin B. Durning, 95th Cong., 1st sess., 1977, p. 14.

[67]Interview with Mr. Marvin B. Durning, EPA Deputy Administrator for Enforcement, Washington, D.C., January 30, 1980.

[68]Freeman interview; Durning interview.

comply with both the spirit and letter of pollution control statutes. And if such attitudes were not enough to cause each man to wish an end to the interagency dispute, their meetings with Senator Muskie during confirmation hearings would certainly help. For example, Muskie lectured Freeman: "I want you to go down to the TVA and grab those sons of bitches by the nape of the neck and drag them into compliance with my law!"[69]

Upon joining the TVA Board, Freeman learned that the animosity between the two agencies was so strong that the two had broken off negotiations.[70] Freeman had many friends within the Carter Administration, not the least of whom was EPA Administrator Douglas Costle. TVA General Manager Lynn Seeber hoped to take advantage of Freeman's contacts to reestablish talks with EPA. Seeber, maintaining that TVA had to "get this thing behind us" if the agency was to meet the power needs of the Valley, implored Freeman to "find someone to surrender to."[71] While there is some question as to whether Freeman pursued negotiations on his own or was authorized by fellow Board members to do so, the result was the same. With Freeman and Durning "acting as judges," EPA and TVA hammered out a settlement designed to end the prolonged dispute.[72]

The agreement negotiated by Freeman still had to be approved by the TVA Board as a whole. Chairman Wagner and fellow Board member William Jenkins had seen the agency through the dispute from its inception and

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[69] Freeman interview.

[70] Ibid.

[71] Ibid.

[72] Hungerford interview.

were not about to change their positions now. Not unlike Freeman, Wagner also saw TVA as the holder of a public trust and as more than another power company. But he saw the agency's obligation to the public interest in a different light than did Freeman. As a federal agency, Wagner would aver, TVA had an obligation to challenge "unwise" policies that "didn't make sense."[73] Precisely because TVA's compliance would be used to bring pressure on others to comply, and because in his view compliance would stymie economic growth if applied to all segments of society, EPA's efforts had to be challenged.[74] For Board member Jenkins, "other agency interference" in the decision-making processes of the TVA combined with many of Wagner's reservations to cause him concern about the interagency pact.[75] Not surprisingly, both men refused to sign the agreement negotiated by their newest colleague.

Throughout 1978 President Carter was presented with, and took advantage of, several opportunities to influence the course of events in the dispute. Early that March, Jenkins resigned from the TVA Board, protesting EPA's interference in TVA's affairs.[76] Later in the month,

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[73]Interview with Mr. Aubrey J. Wagner, former Chairman of the TVA Board of Directors, Knoxville, Tennessee, February 18, 1981.

[74]Ibid. In Wagner's own words, "Once we were brought into compliance, we were going to be thrown in everybody's face as a standard. We had a responsibility to do everything we could to see that the standards made sense."

[75]Jim Ballock, "Frustrated Bill Jenkins Quits TVA," Knoxville News-Sentinel, May 6, 1978, pp. 1, 3,

[76]Ibid.

Chairman Wagner announced his retirement.[77] Carter responded by elevating Freeman to the chairmanship, and by appointing Richard Freeman to fill the Wagner vacancy. What is more, the President indirectly applied pressure for resolution of the dispute on several occasions. In his State of the Union message, he declared that federal facilities must take steps to come into compliance with environmental laws. Then in October, he issued an executive order committing the Administration to the "goals of achieving and maintaining a clean environment," and to making the federal government "the leader in that effort."[78] As one EPA staff attorney suggested, the President's attitude provided "new messages to TVA about its responsibility as a public agency to do more than produce low cost energy."[79] In the wake of all this presidential activity, the two Board members approved the previously rejected agreement on December 14, 1978.[80]

At the time of its signing, the EPA/TVA consent agreement was the most costly environmental clean-up settlement in the history of the nation with a price tag near $1.02 billion. TVA admitted that its ten

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[77]Carson Brewer, "Wagner Refuses to Sign EPA Settlement," Knoxville News-Sentinel, May 18, 1978, pp. 1, 2.

[78]Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978 43 Fed. Reg. 47707 et seq. (1978).

[79]Hungerford interview.

[80]Consent Decree, entered in the U.S. Court for the Middle District of Tennessee, Nashville Division, 1978, for the case of Tennessee Thoracic Society et al. v. Wagner, Civil Action No. 77-3286-NA-CU.

plants had been operating in violation of the CAA and agreed to comply with the limits specified in the consent decree solely through the use of constant controls.[81] TVA also agreed to continue its monitoring of its SO_2 emissions, thus providing citizen groups with data sufficient to hold TVA accountable to the terms of the agreement. To further ensure compliance, an implementation committee consisting of representatives of the plaintiff citizen groups and TVA would review the agency's compliance effort.[82] TVA also acknowledged that the economic benefit of its noncompliance was $260 million, and thereby acknowledged that it was liable for fines equal to that figure. EPA agreed to waive this fine, however, provided TVA installed scrubbers at its Cumberland plant to clean up emissions beyond what was required by law.

Because the consent degree had to be approved by federal district court judges in Alabama and Tennessee, those opposed to its terms were afforded additional opportunities to unravel the agreement. While the decree was approved routinely in Alabama, a group of TVA's electrical distributors—encouraged by the Lieutenant Governor of Tennessee—intervened in the proceedings in Nashville.[83] Citing the excessive costs of the settlement, and what they termed TVA's "overcompliance with the law," they asked Judge Wiseman to conduct an independent cost/benefit assessment of the agreement. Wiseman did so, and in the process it was

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[81] Ibid., p. 102.

[82] Ibid., p. 45.

[83] Interview with Lt. Governor John Wilder, Nashville, Tennessee, September 17, 1980; interview with Mr. Frank Perkins, Tennessee Electric Cooperative Association, Nashville, Tennessee, September 18, 1980.

discovered that EPA and TVA had used faulty data in designing compliance schedules and pollution control techniques at two of the noncomplying plants. EPA agreed to modify the agreement to correct for these errors, thus reducing TVA's compliance costs by approximately $300 million. The agreement was then approved by the court on December 23, 1980.[84]

The Thermal Pollution Dispute

EPA's dispute with TVA over the application of thermal pollution standards to the operations of TVA nuclear plants was a rather abbreviated, amicable episode relative to the SO_2 controversy. Before TVA's concessions would result in the installation of several hundred million dollars worth of cooling towers at its plants, however, four questions had to be settled. First, what was an appropriate thermal pollution standard for portions of the Tennessee River where TVA nuclear plants would be operated? Second, would the Atomic Energy Commission support EPA's thermal pollution control efforts? Third, could individual TVA nuclear plants qualify for thermal pollution standard exemptions provided by the FWPCA of 1972? And finally, would TVA's thermal pollution control system qualify the agency to obtain National Pollutant Discharge Elimination System (NPDES) permits to operate its nuclear plants. Not unlike the SO_2 dispute, TVA would seek relief from EPA's application efforts. The agency would present its positions

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[84] John Moulton, "TVA Steam Plant Pollution Plan Approved," Knoxville News-Sentinel, December 23, 1980, p. 12; Ernie Beazley, "TVA-EPA Settlement Approved," Knoxville Journal, December 23, 1980, pp. 1, 11.

at public hearings, during interagency negotiations, and before the Atomic Energy Commission. But never would TVA pursue relief in a manner so contentious, nor with a strategy so comprehensive and relentless as it did during the SO_2 dispute. Before addressing the specifics of EPA/TVA interaction over thermal pollution control, it is useful to place the controversy in historical perspective.

The Past as Prologue

As noted, TVA's commitment to nuclear power generation began in earnest during the mid-1960's. Prior to EPA's creation in December 1970, TVA had already begun design on one nuclear plant, awarded contracts for three other facilities, and announced plans to have over half of its total generating capacity dependent on nuclear power by 1985. Extant at the same time, however, was a growing national concern with thermal pollution. Opprobrium centered on the ecological threat to fish and aquatic life posed by excessively heated cooling water discharges from power plants, especially those of the nuclear variety.

TVA enjoyed a long established, widely heralded record of concern with water quality in the Tennessee Valley as the agency began its fourth decade of operation.[85] Recognizing the "urgent need" for quantitative data on pollution in the Tennessee River basin, TVA had initiated a

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[85]Callahan, TVA: Bridge Over Troubled Waters, passim.

stream sanitation program in the mid-thirties.[86] The data generated, along with TVA consultants, were used by Valley states during the forties and fifties to develop comprehensive pollution control legislation for area waters. Moreover, since 1955 TVA had studied the effects of heated water discharge from its coal-fired steam plants. Comfortable with a stewardship role that valued water quality as a lever for the "optimum use and future [economic] development of the Valley's streams and reservoirs," TVA proposed a comprehensive, basin-wide plan for water quality management in late 1966.[87] One component of this plan dealt with thermal pollution control, recommending a 93°F temperature limit with a 10°F maximum rise. Thus, as the states sought to develop thermal pollution standards pursuant to the statutory charge of the FWPCA of 1965, and as design began on the first nuclear units at Browns Ferry, TVA had already developed and was actively proselytizing its own thermal standards.

Consonant with the TVA strategy of using the administrative process to attain "some voice in the formulation of standards and requirements with which [TVA would] have to comply," TVA representatives testified at public hearings throughout 1966 and 1967 that its proposed standards should be accepted by both the Alabama Water Improvement Commission and

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[86] Dr. O. M. Derryberry, TVA Director of Health, and M. A. Churchill, Chief, TVA Water Quality Branch. Paper presented at Public Hearing Concerning Proposed Water Quality Criteria for that Portion of the Tennessee River Basin in Alabama, Sheffield, Alabama, December 12, 1966, p. 1.

[87] Ibid., p. 2.

the Tennessee Stream Pollution Control Board.[88] While the Tennessee board followed TVA's counsel, its Alabama counterpart did not.[89] Consequently, when the latter called in May 1967 for a significantly more stringent thermal standard, TVA sought administrative relief. The agency testified that Alabama's proposed standards were "entirely unsatisfactory" based on TVA's experiences, as well as the recommendations of aquatic life experts empanelled by the state of Ohio.[90] TVA also assailed the proposed standards as unsupported by available scientific evidence. The day after TVA's testimony, the Alabama board notified the agency that it would indeed adopt TVA's recommendations.[91]

With its position on thermal standards now adopted by both Tennessee and Alabama, TVA moved to design its prospective nuclear plants to meet these standards as inexpensively as possible.[92] Chosen was a control system premised on diluting, rather than actually reducing, thermal pollution from its facilities. Known as a diffuser system, this approach to thermal control consisted of a network of pipes lying at the bottom of a receiving body of water, in this case the Tennessee River and its

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[88]Marquis to Barron and Gartrell memorandum, August 10, 1973, p. 1; interview with Howard Zeller, EPA Region IV, Atlanta, Georgia, May 15, 1981; and memorandum from M. A. Churchill, Chief, TVA Water Quality Branch, to F. E. Gartrell, TVA Assistant Director of Health, June 28, 1967, p. 2.

[89]See 33 Fed. Reg. 9877 (1968) and 33 Fed. Reg. 9879 (1968).

[90]Churchill to Gartrell memorandum, June 28, 1967, p. 2.

[91]Ibid., p. 3.

[92]Memorandum from Howard Zeller, EPA Region IV, to the Files, June 27, 1968.

tributaries. After water from these sources was passed through the nuclear reactor as coolant, it would be discharged as extremely hot water through these pipes and dispersed over large areas of the river. The discharge would, in this fashion, be mixed with cooler waters to lower its temperature. Moreover, should natural water temperatures at any time be too warm to allow sufficient dilution, TVA would temporarily reduce plant operations. Yet, even as TVA designed its Browns Ferry and Sequoyah plants in this manner between 1968 and 1970, the Interior Department began raising questions about the adequacy of the thermal standards issued by Alabama and Tennessee.

Recall that under the 1965 Water Quality Act, state standards could not take effect until approved by the Interior Department. To TVA's dismay, the Department notified Tennessee and Alabama in February 1968 that their proposed thermal standards were too lax.[93] Most significantly for TVA, the agency's diffuser system could not hope to meet the more stringent standards espoused by Interior officials. Discussions between federal and state officials during the spring of 1968 produced no agreement on an acceptable standard. Consequently, in July the Interior Department officially disallowed the thermal standards of the two states while it pursued continued talks with their representatives.[94] Concurrently, and despite the absence of official thermal standards, the Department sought to convince TVA to voluntarily cooperate with its

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[93]Letter from Stewart Udall, Secretary of the Interior, to Alabama Governor George Wallace, February 15, 1968, p. 1.

[94]This was done on July 10, 1968. See 33 Fed. Reg. 9879 (1968).

version of appropriate thermal standards.[95] To meet the Department's request, however, TVA would have had to redesign its nuclear plants at Browns Ferry and Sequoyah to accommodate very costly cooling towers. TVA officials balked at these suggestions, asserting that to meet "more stringent temperature requirements [in this fashion] would cause a serious delay in the beginning of plant operations" at the two sites.[96] Such a delay would jeopardize, they maintained, TVA's ability to meet the power demands of the Valley. With TVA pressing ahead with its diffuser system, one Interior official summed up his agency's plight in this way: "If we cannot convince TVA . . . then every utility in the country will tell us to go to hell when we tell them they've got to have cooling towers."[97]

Thus, as EPA came into existence in late 1970, the seeds of its dispute with TVA had already been sown. TVA, Alabama, and Tennessee were all promoting thermal standards unacceptable to EPA's predecessor, the Interior Department. And Interior's two and a half year old campaign to persuade the states to issue stricter thermal standards was still stalemated. Meanwhile, TVA was forging ahead and designing its nuclear plants to meet the discredited thermal standards of Alabama and Tennessee despite Interior's warnings. It was under such circumstances that the first issue to be resolved during the dispute came to the fore: what

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[95] Zeller to Files memorandum, June 27, 1968, p. 2.

[96] Memorandum from T. P. Gallagher, TVA, to the Files, July 5, 1968, p. 1.

[97] "Heated Water Control Crux of Likely Federal Agencies Clash," Electrical World (September 29, 1969), p. 20.

were the appropriate thermal pollution standards for portions of the Tennessee River where TVA planned to operate its nuclear plants?

The Dispute Is Joined

Under the FWPCA of 1965, EPA could promulgate water quality standards for any state failing to propose such requirements, or proposing ones unacceptable to the agency. To do so it had only to convene a standard-setting conference and subsequently issue binding regulations for the state. EPA Administrator Ruchelshaus saw the standard-setting conference as an effective, highly visible enforcement tool for his neophyte agency. Consequently, after repeated exchanges with the state of Alabama proved fruitless in resolving their disagreement over thermal standards, he convened a standard-setting conference in April 1971 to resolve the problem.[98]

In February 1971, as EPA announced it would convene the Alabama conference and after TVA had let contracts for two more nuclear plants, the Alabama Power Company notified TVA that the state of Alabama did not have "sufficient data to support much of an argument against EPA's proposed thermal standards," and would welcome any assistance TVA could provide.[99] TVA, convinced that EPA would not change its interpretation, nevertheless testified at the conference against what it termed the

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[98]Letter from William Ruchelshaus, EPA Administrator, to Alabama Governor George Wallace, February 5, 1971.

[99]Memorandum from M. A. Churchill, Chief, TVA Water Quality Branch, to F. E. Gartrell, TVA Asst. Director of Health, March 2, 1971.

"net-detrimental" effects of thermal standards.[100] The agency contended that EPA's standards were not based on sound technical data, and that the public interest required a balance of environmental, energy, and economic concerns absent in its proposals. TVA recommended that additional research be conducted and that "reasonable" interim standards be issued: standards that could later be adjusted to reflect acquired scientific knowledge.[101] Significantly, however, the agency pledged as well to comply with whatever standard was eventually issued.

As expected, EPA adhered to its proposal and formally recommended in July 1971 an 86°F, 5°F thermal standard for portions of the Tennessee River where TVA's Browns Ferry nuclear plant was located.[102] Also in July, the state of Tennessee was holding public hearings on its previously disapproved thermal standard. EPA Region IV officials attended these hearings, proposing an 89.6°F, 5.9°F standard for portions of the Tennessee River where TVA's Sequoyah plant was located.[103] State officials, aware of EPA's determined effort in Alabama and seeking to qualify for future pollution control grants, voluntarily accepted EPA's proposal in late October.[104] Thus, as TVA prepared its Browns Ferry and

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[100] Ibid.

[101] Ibid.

[102] Letter from Howard Zeller, EPA Region IV, to J. L. Crockett, Jr., Director of Technical Staff, Alabama Water Improvement Commission, July 21, 1971.

[103] Memorandum from W. R. Nicholas, Asst. Chief, TVA Water Quality Branch, to M. A. Churchill, Chief, TVA Water Quality Branch, April 2, 1971.

[104] Memorandum from Larry Clark, TVA Special Project Staff, to R. A. Buckingham, Supervisor, TVA Special Project Staff, November 4, 1971.

Sequoyah plants for operation, it was presented with thermal standards that its current plant designs could not meet. Absent a relaxation of standards, TVA would have to add expensive auxiliary cooling towers to most of its prospective nuclear contingent.

Any hope TVA had that the Tennessee and Alabama standards might be relaxed before they became law in May 1972 was soon dashed. In December 1971, EPA Region IV officials sent a strongly worded letter to the agency avering that it was "important for [TVA] to know that EPA will not accept any maximums [i.e., maximum standards] other than those proposed."[105] TVA responded that they had already "acted in good faith" to bring their nuclear plants into compliance with state standards by designing them to include costly diffuser systems.[106] Now EPA had "revised" the standards in ways requiring TVA to retrofit these plants with cooling towers just as they were scheduled to begin providing needed electricity to TVA customers. Because retrofitting was considerably more expensive than if towers had been included in the original plant designs, and since it would cause debilitating delays in plant openings, the TVA Board agreed only to study the feasibility of cooling towers.[107]

During early 1972 EPA, TVA, and the states involved sparred regularly regarding the new thermal standards. In contrast to the

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[105] Letter from Jack E. Raven, EPA Region IV Administrator, to F. E. Gartrell, TVA, December 17, 1971.

[106] Zeller interview; interview with Charles Kaplan, EPA Region IV, Atlanta, Georgia, May 14, 1981; and interview with Bruce Brye, TVA, Chattanooga, Tennessee, May 16, 1981.

[107] "TVA Power Plant Said Environmentally Okay," Mobile Register, November 4, 1972, p. 1.

SO_2 experience, however, they did so in a manner portrayed by all concerned as "highly professional."[108] Talks focused on the Browns Ferry nuclear plant, with TVA suggesting that the natural temperature of the Tennessee River at that location regularly exceeded EPA's new standard during the summer months—even without TVA operating the new facility.[109] Consequently, TVA claimed that it was being asked to reduce the river's temperature below its natural rate, a task the agency maintained was both unreasonable and of no appreciable benefit to the environment.[110] Moreover, agency officials contended that cooling towers would need to be operated only 28 percent of the time to comply with the standards, making their $43 million price tag highly cost inefficient and a "misdirection of resources."[111] As an alternative, TVA offered a four-pronged approach to pollution control that included its diffuser system, interrupted plant operation when standards were exceeded, increased supplies of diluting water released from upriver reservoirs, and continued research to improve the data base on thermal pollution effects.[112]

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[108] Zeller interview; interview with James Morris, TVA, Chattanooga, Tennessee, May 16, 1981; and Kaplan interview.

[109] Ibid.; Tennessee Valley Authority, Annual Report of the Tennessee Valley Authority: 1973 (Knoxville: TVA, 1973), pp. 43-44. Henceforth cited as TVA Annual Report: 1973.

[110] TVA Annual Report: 1973, p. 20.

[111] Ibid.; letter from Dr. O. M. Derryberry, TVA Manager of Environmental Science, to John Bolton, Chief Administrative Officer, Alabama Water Improvement Commission, June 12, 1972.

[112] Memorandum from Charles Kaplan, EPA Region IV, to Sanitary Engineer, EPA Federal Facilities Branch, January 28, 1972.

Responding in kind, EPA Region IV officials said that the "natural" river temperatures of which TVA spoke were not natural at all; they were caused by the upstream operation of TVA's coal-fired plants.[113] Environmental improvements, therefore, really would take place once cooling towers were installed. They also suggested that retrofitting the plants was a self-imposed hardship for TVA since the agency had consciously failed to heed the Interior Department's admonitions during the late sixties to incorporate towers in their original plant designs.[114] In this fashion, EPA remained adamant that if cooling towers were not installed at Browns Ferry to meet the new standards, TVA would be operating that plant in violation of the law and be subject to its sanctions. The decision was TVA's. Events, however, were already transpiring that would severely limit TVA's options. Involved was the question of whether the Atomic Energy Commission (AEC) would support EPA's thermal control efforts.

Evolving Compliance

As Ruchelshaus began his campaign to establish the credibility of EPA's enforcement commitment in early 1971, TVA was already immersed in the lengthy, two-step nuclear plant licensing process instituted pursuant to the Atomic Energy Act. The AEC had previously issued construction permits for TVA's Browns Ferry plant, and public hearings had begun on the latter's application for the same at Sequoyah. Moreover, since the

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[113] Zeller interview; Kaplan interview; and Linton interview.

[114] Ibid.

agency intended to begin generating electricity at Browns Ferry in mid-1973, TVA was also preparing for AEC hearings on its application for operating permits at that facility. Significantly for EPA and TVA, this was also a time when environmental values were increasingly factored into the nuclear licensing process by the AEC. In enacting the National Environmental Policy Act in 1969, Congress required government agencies such as the AEC to consider environmental factors when issuing construction and operating licenses to applicants.[115] What is more, because Section 21(b) of the FWPCA required that EPA ensure that state standards be met by federal applicants for such licenses, EPA would have an opportunity to influence the AEC's decisions concerning TVA power plants. Then in July 1971, a landmark D.C. Circuit Court of Appeals decision in Calvert Cliffs Coordinating Committee v. AEC required the Commission to conduct its own independent environmental impact assessments and to no longer exempt plants issued construction permits before January 1970 from remedial clean-up efforts.[116]

The Calvert Cliffs decision had significant implications for the AEC regulatory process, for the TVA power program, and for the EPA

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[115] The National Environmental Policy Act of 1969, Pub. L. No. 91-190, 1970, 83 Stat. 852, U.S.C. Sections 4321-4347. NEPA, of course, referred to all federal agency decision-making, not just the activities of independent regulatory commissions. For excellent discussions of NEPA see Frederick R. Anderson, NEPA in the Courts (Baltimore: Resources for the Future, Inc., distributed by the Johns Hopkins University Press, 1973) and Richard A. Liroff, A National Policy for the Environment: NEPA and Its Aftermath (Bloomington: Indiana University Press, 1976).

[116] Calvert Cliffs Coordinating Committee v. Atomic Energy Commission, 499 F 2d 1109 (1971).

thermal pollution control effort. For the AEC, the decision meant that it would now be liable for environmental law suits challenging its licensing decisions. For TVA, it meant not only that Browns Ferry was no longer exempt from AEC-imposed plant modifications because of its pre-1970 construction permits, but also that its plans for controlling heated water discharges would now have to be approved by EPA, the states, and the AEC. And for EPA, it meant that a credible enforcement tool for achieving TVA compliance was potentially at hand: it was now possible that absent TVA compliance with thermal standards, the agency's highly touted nuclear plants would be denied licenses to operate. Still in doubt, however, was if and when the AEC could be convinced to accept EPA's stringent standards as a condition for issuing TVA nuclear plant licenses.

TVA could little afford the luxury of awaiting resolution of this question. The agency felt that if Browns Ferry failed to begin operation on schedule in 1973, the risk of severe power shortages for the entire Southeast was substantial.[117] Thus, nearly seven months after Calvert Cliffs raised the spectre that the plant might not qualify for an operating license, and as its parrying with EPA and the states portended only long-term, marginal prospects of success, TVA announced in early 1972 that it would install cooling towers at Browns Ferry.[118] In its announcement, however, the agency termed the revised standards

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[117] TVA News, February 2, 1972, p. 1.

[118] Ibid.; TVA Annual Report: 1973, pp. 43-44.

"environmentally unnecessary," and prophesied that its $43 million expenditure for the towers would provide "no appreciable improvement to the environment."[119] TVA also impugned the knowledge base of the standards, saying that it was "not adequate to determine precisely what temperature limits were necessary to ensure protection of adequate life."[120] Finally, because the towers could not be ready for use until fourteen to twenty-four months after the plant was scheduled to begin operations, TVA proposed to operate Browns Ferry during the interim using only its diffuser system to control heat discharges.[121] To be held to the revised Alabama standards, the agency maintained, would force the plant to remain idle.

Unfortunately for TVA, portions of its compliance plan pleased neither its "friends" nor its "foes" on the thermal pollution issue. Moreover, these individuals would seek to use the nuclear licensing process to pursue their disparate objectives. To foes such as Alabama's Attorney General William Baxley and his staff assistant William Garner, interim operation of the plants with diffusers would be "a menace to the Tennessee River."[122] Indeed, Garner suggested that he and other environmentalists might take legal action, if the state did not, to block the

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[119] Ibid.

[120] TVA News

[121] Letter from Jack E. Raven, EPA Region IV, to Dr. F. E. Gartrell, TVA, May 22, 1972; Tennessee Valley Authority Office of Health and Environmental Science, Final Environmental Statement, Browns Ferry Nuclear Plant, Units 1, 2, and 3, Vol. I (Chattanooga: TVA, 1972), pp. 3.12-3 to 3.12-4.

[122] Frank Sikora, "N-Plant Will Open without Cooling Unit," Birmingham News, August 23, 1972, p. 1.

plant's impending opening.[123] Moreover, in a meeting in March 1972, as well as in a letter in May, EPA formally notified TVA that its plan to violate state standards during the interim period was unacceptable.[124] In contrast, Vanderbilt Professor of Environmental Engineering, Frank Parker, saw the plan as a violation of NEPA, claiming it failed to adequately assess the cost-benefit ratio of cooling tower costs to environmental benefits as that law required.[125] He maintained that towers were too costly and endangered the environment. In late 1972, both Parker and Baxley (on behalf of the state of Alabama) sought to intervene in the Browns Ferry operating license proceedings before the AEC.

As these petitions for intervention were being pursued the AEC, fearing that to do otherwise would invite law suits by environmentalists challenging its licensing decision, announced it would hold TVA accountable to EPA's most stringent thermal standards.[126] TVA, fearing the severe licensing delays that Baxley's intervention would engender, agreed to comply "with all applicable thermal water quality standards of the state of Alabama and the United States."[127] What is more, TVA's

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[123] Ibid.

[124] Raven to Gartrell letter, May 22, 1972.

[125] Atomic Energy Commission, memorandum to the Files, September 1973, p. 5.

[126] Brye interview. In Brye's own words, AEC "passed the buck" to EPA.

[127] Ibid.; "Will Comply, TVA Pledges," Birmingham News, November 6, 1972, p. 1.

agreement would formally be incorporated into the operating license issued to it for Browns Ferry, thus making compliance with EPA thermal standards a condition for operating that plant.[128] In response to this announcement, Baxley dropped his petition to intervene, while Parker pressed on with his challenge.[129] At this point, TVA officials informed Parker that while they agreed with the substance of his arguments, they felt that the AEC licensing process was the wrong forum for challenging thermal standards.[130] Not only was it time-consuming and thus threatening to TVA's nuclear power production schedule, but the recently enacted FWPCA of 1972 afforded another, more promising opportunity for relaxing thermal standards.

The FWPCA of 1972, enacted in October of that year, brought both hope and apprehension to the TVA. Hope, that is, that it could obtain exemptions from thermal standards and effluent limitations at individual nuclear plants based on Section 316 of the act; and apprehension that cooling towers might be required in order to meet the best practicable control technology (BPT) criteria for obtaining National Pollutant Discharge Elimination System (NPDES) permits to operate its plants. Thus the EPA/TVA thermal pollution controversy would hinge upon the resolution of two questions. First, could individual TVA nuclear plants

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[128]"Stipulation of Petitioner, State of Alabama, and Applicant, Tennessee Valley Authority Browns Ferry Nuclear Plants, Units One, Two, and Three," March 26, 1973.

[129]Ibid.

[130]Letter from David G. Powell, TVA Division of Law, to Frank L. Parker, Professor, Vanderbilt University, January 2, 1973.

qualify for thermal pollution exemptions? And second, would TVA's diffuser system be sufficient for obtaining NPDES permits from EPA?

Agreeing to Systemwide Compliance

In November 1972, as TVA sought an operating license from the AEC for its Sequoyah nuclear plant, the agency conducted an internal assessment of that plant's chances for obtaining an exemption from thermal standards.[131] The results of this analysis, made available in March of the following year, were discouraging to TVA officials: the agency lacked "sufficient information" at that time to seek a Section 316 exemption no matter what criteria EPA would require as evidence for dispensation.[132] Reviewers also noted that two other options existed for TVA: either install cooling towers at the plants or ask the president for individual exemptions.[133] Others raised additional options. TVA could either file court suits challenging effluent limits once they were issued by EPA (as many other industries would successfully do), or claim exemption as a federal facility.[134] With presidential exemption viewed unlikely, court suits seen as unacceptably time-consuming, and federal facility exemption perceived implausible, TVA opted for the Section 316 exemption route.

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[131]Morris interview.

[132]Memorandum from M. B. Hughes, Jr., TVA Director of Power Resource Planning, to F. E. Gartrell, TVA Director of Environmental Planning, and T. H. Ripley, TVA Director of Forestry, Fisheries and Wildlife Development, March 9, 1973.

[133]Ibid.

[134]Zeller interview; Kaplan interview; and Morris interview.

TVA learned in mid-1973 from the Utility Water Act Group (UWAG) and its own informal discussions with EPA officials that the agency would likely propose guidelines allowing three ways to gain exemption from applicable thermal standards and limitations.[135] As chronicled in Chapter II, these included: demonstration of no appreciable prior harm to aquatic life; evidence that a designated "representative, important" fish species would not be harmed; and extrapolations from the experiences of comparable plants or thermal diffusion modeling that no harm would occur. With this information, and with EPA's cooperation, TVA began a systemwide analysis of plants, both presently operating and projected, to determine if any might qualify for exemption.[136]

Since TVA's nuclear program was so new, the first option of demonstrating the absence of prior harm was eliminated immediately. So too was the option of extrapolating from the experiences of comparable plants since none existed given the unprecedented size of the agency's plants and the nascent stage of nuclear power development in general. When disagreement arose over the specification of a representative species for the Tennessee River, the only option remaining was thermal diffusion modeling.[137] However, the joint EPA/TVA analysis convinced agency officials that sufficient data were unavailable to provide the necessary extrapolations.

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[135]"Utility Water Act Group (UWAG) Report No. 10," presented by Hunton, Williams, Gay and Gibson, Richmond, Virginia, December 19, 1973.

[136]Morris interview.

[137]Memorandum from E. D. Dougherty, Environmental Engineer, TVA Power Research Staff, to the Manager's Files, June 8, 1973.

As TVA was receiving cues about forthcoming thermal exemption guidelines, EPA was also signaling its intentions concerning BPT standards for NPDES discharge permits. In both an affidavit to the Atomic Energy Commission and a letter to TVA's legal staff, EPA stated that it intended to require cooling towers as a condition for issuing a discharge permit for Browns Ferry.[138] What is more, EPA "anticipated the same requirement in its definition of the best practicable control technology" for obtaining any NPDES permit in the future.[139] TVA was thus forewarned that cooling towers would most likely be required at all its nuclear plants.

As of September 1973 TVA's situation relative to thermal pollution requirements at its nuclear plants appeared bleak. Needing AEC operating licenses for all its plants, TVA found that it was required to meet EPA's more stringent standards as a condition for that license. And needing an NPDES permit to emit heated discharge from its plants, TVA found that EPA would probably require cooling towers as a condition for that permit. Thus, despite indications from the AEC that means other than cooling towers (such as limitations on power levels) might satisfy their licensing conditions,[140] and despite the promise that revised water quality criteria would soon be issued by the National Technical

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[138]Letter from Jack E. Raven, EPA Region IV Administrator, to David G. Powell, TVA Division of Law, October 16, 1973.

[139]Ibid.

[140]Letter from David G. Powell, TVA Division of Law, to Charles Kaplan, EPA Region IV, September 13, 1973.

Advisory Committee that might allow less stringent thermal standards, TVA capitulated to EPA.[141] Unlike the SO_2 dispute, there would be no court challenges to EPA standards or authority. And there would be no appeals to Congress to change the law. Instead, TVA announced that it would install cooling towers at Sequoyah and all scheduled nuclear plants at a total cost of $640 million. The agency's justification: it sought to prevent delays in the licensing process that could have jeopardized power supplies throughout the Southeast had continued challenges to thermal standards and the necessity for cooling towers been mounted.

Discussion

Recounted in this chapter have been the specifics of EPA's experiences in applying SO_2 and thermal pollution policies to the Tennessee Valley Authority during the 1970's. Several striking differences between the two episodes are worthy of note. First, and most obvious, is the difference in the tone of interagency interaction in the two disputes. During the thermal affair, talks were portrayed by all concerned as professional and nonconfrontational. In contrast, as the SO_2 dispute progressed, TVA refused to recognize EPA's enforcement authority, challenging its actions whenever and wherever the opportunity arose. This only made EPA officials more frustrated and more hostile, perceiving TVA's behavior as part of a dilatory strategy to avoid

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[141] This was done in September 1973. See Tennessee Valley Authority, Annual Report: 1975, pp. 47-48.

complying with the law. Interagency negotiations deteriorated rapidly under these circumstances and became so adversarial that they eventually broke down.

Secondly, the two experiences differed radically in terms of TVA's perception of EPA's policy goals and enforcement capabilities. Thermal, as opposed to SO_2, policies were viewed by TVA as affecting much more clearly its power program responsibilities, and as having much less merit. And the enforcement sanctions associated with the former were viewed as much more likely to be applied to TVA's operations. In terms of TVA's power production responsibilities, SO_2 regulations were made to be applied to a segment of its generating capacity that was scheduled to be gradually deemphasized during the decade. Thermal policies, however, were applicable to a nuclear component envisioned as the dominant source of the agency's electricity production by 1985. In regard to the merit of EPA's policy goals, TVA officials were skeptical of the link between SO_2 emissions from their plants and serious health hazards. Moreover, they doubted the ability of constant controls to effectively abate air pollution. In contrast, TVA never doubted that thermal pollution was harmful to fish or that cooling towers could prevent aquatic damage. Finally with regard to EPA sanctions, TVA viewed the NPDES permit requirements and civil penalties for noncompliance provided by the FWPCA as a "tough, workable enforcement scheme."[142] No such perception was afforded EPA's draconian sanctions of closing TVA power plants or bringing TVA to court.

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[142]Marquis to Barron and Gartrell memorandum, August 10, 1973, p. 4.

Thirdly, the two application experiences differed in terms of the number, types, and perspectives of external actors attempting to influence implementation. EPA's early efforts to apply SO_2 policy to TVA were complicated by repeated attacks on environmental regulations raised by other federal agencies (the OMB, the Commerce Department, the Federal Energy Administration) and well-financed private sector groups. In contrast, its thermal efforts did not receive the same sustained, often truculent attention from these actors. Unlike the SO_2 dispute, EPA was spared from OMB efforts to change thermal regulations or Commerce Department attempts to amend the FWPCA as it sought to apply its policy to the TVA. And unlike the SO_2 episode, it did not have to contend with multimedia blitzes by the American Electric Power Company assailing its implementation efforts. By the same token, however, TVA did not have to contend with licensing requirements imposed by external agencies during the SO_2 controversy, while it did have to obtain operating and construction permits from the Atomic Energy Commission during the thermal affair.

Finally, EPA seemed more confident, determined, and consistent when applying thermal, as opposed to SO_2 policies. At no time were remarks analogous to "we weren't sure we were doing the right thing" ever made during the thermal controversy. Equally unparalleled in the thermal episode was EPA's vacillation in the SO_2 affair concerning the standards and control techniques TVA would be held accountable to. Since 1968, EPA and its predecessors were determined to hold TVA accountable to thermal standards requiring the installation of cooling towers.

Having examined these two cases of intragovernmental policy implementation over the past three chapters, it is now appropriate to return to the research questions posed at the beginning of this study. Chapter V will seek to account for TVA's rather swift compliance with thermal pollution policy and its prolonged, vehement opposition to SO_2 implementation efforts. Also discussed will be the implications of the two cases for policy implementation research and for the administrative state.

CHAPTER V

THE POLICY IMPLEMENTATION DILEMMA REVISITED: ANALYSIS, IMPLICATIONS, AND PROSPECTS

Political scientist James E. Anderson has insightfully written that all public policies contain an element of social control; one "designed to cause people to do things, refrain from doing things, or continue doing things that they otherwise would not do."[1] Historically, federal government agencies have applied, rather than been the targets of, such policies. With the enactment over the past decade of laws known collectively as the new social regulation, however, this situation has been radically altered. Today it is not unusual for one national bureaucracy to be legally charged with controlling the behavior of another that is pursuing its own policy responsibilities. Most federal agencies, however, are reluctant to change or modify their behavior at the behest of sister agencies as the implementation of these laws requires. They fear that changes might complicate, even frustrate, the realization of their own statutory responsibilities. Consequently, there has emerged an additional policy implementation dilemma to complement the familiar problems posed by administrative federalism; a dilemma rarely investigated by implementation researchers and having significant implications for the administrative state. The essence of

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[1]James E. Anderson, Public Policy-Making, 2d ed. (New York: Holt, Rinehart and Winston, 1979), p. 136.

that dilemma: how, to what extent, and under what circumstances, can one federal agency hold another accountable to the law when to do so the former must critically alter the behavior of the latter?

To refine our largely impressionistic understanding of the intragovernmental implementation dilemma, this study has examined two of its more noteworthy examples: the Environmental Protection Agency's efforts to apply its sulfur dioxide and thermal pollution control policies to the Tennessee Valley Authority. In the preceding chapters, the specifics of each case were described, compared, and contrasted. To frame the analysis, the study was organized around the three analytically distinct sets of activities reputed by Charles O. Jones to be essential components of implementation: organization, interpretation, and application. Using Jones' typology as a framework provided a "feel" for what can happen as laws funnel down from Congress, are interpreted by implementing federal bureaucracies, and are then applied to sister agencies. The study now returns to the research questions posed in Chapter I. After a review of the two EPA/TVA experiences, explanations for TVA's divergent behavior during the two episodes are offered. This is followed by an assessment of what the two cases suggest about emerging policy implementation theory. The chapter concludes by assessing the implications of the policy implementation dilemma for the administrative state.

Recapitulation

In effect, both the Clean Air Act and the Federal Water Pollution Control Act placed the EPA and the TVA on a collision course. Given the

nature of the implementation organization provided by each law the TVA, as a major source of SO_2 and thermal pollution, and the EPA, as the federal agency responsible for carrying out pollution control laws, were destined to conflict.

The Sulfur Dioxide Controversy

During the prolonged, often heated SO_2 dispute over EPA's interpretation of standards, control techniques, and TVA's status as a federal facility, the agencies clashed explicitly on four separate occasions. The first clash occurred in September 1974 when TVA filed suit to have a federal court overrule the EPA administrator's rejection of a proposed Kentucky regulation that would have classified the agency's SDEL system as an acceptable pollution control technique. The second occurred one week later when EPA notified TVA that ten of its twelve coal-fired steam plants were violating SO_2 standards issued pursuant to the CAA. Both events were products of the failure of a Joint EPA/TVA Task Force to come to a negotiated agreement over constant emission controls at TVA plants. Immediately after these incidents, however, interagency negotiations resumed. The third collision took place two years later when, in November 1976, the EPA issued its second notice of noncompliance against TVA. Negotiations again followed but proved of no avail. The final clash occurred in June 1977 when EPA joined a citizen enforcement law suit filed against her sister agency.

New negotiations, this time involving citizen group representatives as well as EPA and TVA officials, began soon after the suit was filed. This round of negotiations was especially distinct from its predecessors

in that a new director of EPA enforcement and a new TVA Board member played a direct, active role in the discussions. These negotiations produced a highly technical, extremely detailed, and very comprehensive agreement that essentially represented a victory for EPA. The new TVA Board member, S. David Freeman, was unable to persuade fellow Board members Wagner and Jenkins to approve the settlement he had bargained in their behalf. Both left TVA without ratifying the consent decree, and only after Richard Freeman joined the Board did TVA officially approve the negotiated settlement in December 1978. With the signing of that agreement, TVA ended its nearly six-year campaign to avoid compliance with the CAA under EPA's terms; a campaign waged relentlessly before Congress, the courts, and the states, as well as in the arena of public opinion.

The Thermal Controversy

In contrast, the controversy over thermal pollution control at prospective TVA nuclear plants was a much abbreviated, rather amicably-resolved episode; one that despite its comparable multimillion dollar cost to TVA never sparked the same type of comprehensive, heated assault on EPA's efforts mounted during the SO_2 affair. Before the dispute over EPA's interpretation of appropriate thermal water quality standards and control technology was resolved in EPA's favor in late 1973, TVA would look to the states, to the Atomic Energy Commission (AEC), and to EPA itself for relief. It would do so, however, only briefly and without success.

While formal, distinct flashpoints of conflict did not characterize this episode, debate of an informal, highly professionalized nature ensued throughout. EPA's predecessor, the Interior Department, had since 1968 informally encouraged TVA to design its nuclear plants with cooling towers to meet very restrictive, albeit as yet unofficial thermal standards. The agency opted instead for a diffuser system design that could not meet such standards if issued. TVA hoped to persuade officials that less stringent, less costly standards would suffice to protect aquatic life. An EPA standard-setting conference in Alabama, however, formally established the more stringent standards for that state in July 1971; standards applicable to TVA's Browns Ferry nuclear plant. Tennessee followed Alabama's lead and adopted EPA's recommended standards in October 1972; standards applicable to TVA's Sequoyah nuclear plant.

TVA tried throughout 1971 and 1972 to convince EPA and the states to relax these standards. At the same time it sought to obtain operating licenses from the AEC for its Browns Ferry and Sequoyah plants. The AEC, pressed by the Calvert Cliffs decision and the National Environmental Protection Act to consider the ecological harm posed by nuclear plant sitings, ruled that EPA's more stringent standards would have to be met by TVA as a condition for receiving an operating license at Browns Ferry. TVA capitulated reluctantly in early 1972, but continued to press EPA for relief. Later that same year, the Federal Water Pollution Control Act of 1972 was enacted. Although the Act allowed exemptions from thermal standards at individual plants, the agency learned informally that EPA would interpret the bases for exemptions in ways precluding

successful TVA challenges. EPA then notified TVA that cooling towers would be considered as the technological basis for issuing thermal discharge permits. Under these circumstances, TVA announced in September 1973 that it would install cooling towers at Sequoyah and all scheduled nuclear plants. The agency did so maintaining that continued challenges to thermal standards and cooling towers, while appropriate and available in a variety of forums, would cause licensing delays that could jeopardize power supplies throughout the Southeast.

Analysis

Having reviewed what did happen when EPA attempted to apply its SO_2 and thermal pollution policies to the TVA, it is time to speculate as to why the two experiences happened as they did. To be explained is why TVA's responses to EPA's efforts were so dramatically different in the two cases: relatively swift, rather amicable compliance with thermal policy as opposed to protracted, often truculent noncompliance with SO_2 policy. Those analytically distinct factors that appeared most influential in conditioning TVA's behavior are summarized below.

Policy/Mission Proximity

One of the factors most powerful in conditioning TVA's divergent behavior was the difference in the degree to which SO_2 and thermal policies affected TVA's power program mission. As noted, TVA projected that nearly 55 percent of its generating capacity would be nuclear powered by 1985, while its dependence on coal-fired steam plants would be cut approximately in half by the same date. To effect this change

in nuclear generating capacity TVA had stopped ordering coal-fired plants, begun phasing out older ones then in operation, and begun accepting bids for five nuclear plants. Given the long, and ever increasing, lead times needed to license and get nuclear plants into operation, TVA officials felt they could not afford any delays in the scheduled operating dates of their nuclear contingent if they were to meet their power production responsibilities to the Tennessee Valley. Thermal standards threatened this timetable when the AEC decided to make TVA's compliance with EPA thermal standards a condition for obtaining construction and operating licenses at its plants. TVA faced an apparent no-win situation. If the agency agreed to meet these standards, the operation of its nuclear plants might be delayed for eighteen to twenty-four months while requisite cooling towers were constructed. But to challenge their stringency, or risk the intervention of "friends or foes" in such arenas as the nuclear licensing process, could cause even longer delays; ones that would seriously jeopardize its ability to successfully complete its power production mission. Although doubting the wisdom of EPA's thermal policies—and although AEC, congressional, and legal appeals were available to the agency—TVA opted to forego further challenges to avoid the mission threatening additional delays they would engender.

In contrast, the agency's coal-fired plants were already on-line and being gradually deemphasized as sources of TVA power production. Delay in the case of these plants—rather than mission threatening—was an asset. The longer TVA could delay in installing constant control systems, the fewer the number of coal plants it would have in operation.

Consequently, the smaller the quantity of SO_2 pollution that would be emitted from its facilities and the less of a regulatory target it would become. Moreover, delay provided more opportunity for EPA, the Congress, or a new administration to relax SO_2 policy. Because TVA "got away from fossil fuels and into nukes,"[2] it could pursue challenges in a variety of public and private sector forums without jeopardizing its ability to meet the power demands of the TVA service area.

Complexity of Joint Action

A second set of factors influential in conditioning TVA's strategy in the two cases were differences in the number, types, and perspectives of implementation veto points in the two cases. Researchers typically refer to these characteristics as the complexity of joint action. EPA's efforts to apply SO_2 policy to TVA were severely complicated by the Quality of Life Review procedures instituted by the Office of Management and Budget in 1974; a review process nonexistent during the thermal controversy. Pursuant to this process, all EPA regulations had, in effect, to be approved by all other federal agencies for their impact on such matters as energy supplies and the economy. Consequently, such agencies as the Commerce Department and Federal Power Commission were able to raise repeated challenges to SO_2 pollution control efforts through institutionalized "veto points." What is more, these challenges were sometimes quite productive; witness President Ford's submission to

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[2]Traina interview.

Congress of Commerce Department amendments to the CAA. Results such as this not only frustrated EPA's interpretation of the law; they also buoyed TVA's hopes that either legislative or administrative relief might be forthcoming and thus fueled the agency's recalcitrance.

Similarly, the need for TVA to obtain licenses for its nuclear plants from the Atomic Energy Commission was unparalleled in the SO_2 controversy. This made a significant difference in the two cases, speeding TVA's compliance with thermal standards. While potentially an obstacle to EPA's efforts in this matter since the Commission could have issued licenses based on less stringent standards, the AEC chose instead to incorporate EPA's recommendations as conditions for licenses at Browns Ferry and Sequoyah. Moreover, the delays in getting TVA nuclear plants on-line occasioned by the lengthy licensing process were critical to the agency's decision to forego continued challenges and to install cooling towers at all its nuclear plants.

Validity of Causal Theory

A third influential factor conditioning TVA's divergent behavior was the validity of the causal theories underlying SO_2 and thermal pollution control. Causal validity refers, in the case of pollution control, to the certainty attached to the relationship between limiting pollutant emissions and actually protecting human health and aquatic life. Differences on this dimension accounted in part for differences in the nature and tone of the SO_2 and thermal application challenges. These in turn affected the duration of the two controversies, prolonging

the former while attenuating the latter. As EPA sought to apply its SO_2 policy to the agency, TVA persistently raised threshold questions about the cause/effect relationship upon which it was premised. For example, agency officials vehemently maintained that insufficient evidence existed linking long-term SO_2 coal plant emissions to respiratory deaths and acid rain problems. And Chairman Wagner would tenaciously assert that SO_2 actually "sweetened the soil," thus increasing crop yields and improving indirectly the nutritional health of Valley residents.[3] TVA also joined those chastising scrubber technology as essentially unworkable at large power plants. Definitive evidence refuting these charges was simply not available to EPA in the early seventies.

In contrast, TVA never challenged the link between thermal pollution and harm to aquatic life. This was because the relationship between the two was so well documented; the federal government had since 1962 compiled an inventory of acknowledged thermal pollution fish kills. Agency officials also did not dispute that TVA nuclear plants would pose a severe thermal problem, acknowledging that such plants typically produced 40 to 60 percent more heat than did their conventional counterparts. And because cooling towers were so widely accepted within the engineering profession as an effective thermal control device, at no time did the agency dispute their ability to protect the aquatic life around its plants. TVA raised only the more technical issues concerning

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[3]Wagner's contention was recently supported in a staff study done by J. C. Noggle, TVA biologist in Muscle Shoals, Alabama. Noggle maintained that soil sulfur deficiences would result from clean-up efforts. Ironically, this study was funded by EPA.

temperature criteria and standards rather than the threshold question of whether emissions really harmed aquatic life. This difference in the validity of causal theories led to more professional, less confrontational discussion between the two agencies during the thermal as compared to the SO_2 dispute. This, in turn, resulted in less uncompromising attitudes on the part of thermal discussants, forging a quicker resolution to the cooling tower issue.

Policy Communication

Differences in the manner in which EPA communicated its policies to TVA during its interpretation and application efforts were also critical in influencing the latter's behavior. During the SO_2 affair, EPA struggled over a two and a half year period to come to grips with the constant versus intermittent control strategy question. After notifying then-Governor Jimmy Carter that ICS would not be considered an acceptable control strategy, the agency neither approved nor disapproved their use when it reviewed the original state implementation plans. Following this, EPA initially proposed a regulation disallowing ICS, and then proposed one allowing these techniques. In the end the agency rejected ICS strategies, but only after a prolonged period of flip-flopping on the issue.

EPA's vacillation on the control technology issue was a major factor in delaying TVA compliance with the Clean Air Act. Several TVA officials cited it as justification for noncompliance. And representatives of environmental groups, EPA, and the states suggested that this inconsistency encouraged TVA recalcitrance in two ways: first, by

offering hope that EPA might still be persuaded to accept SDEL and second, by providing political ammunition to those seeking antiscrubber amendments to the Clean Air Act.[4]

EPA's vacillation in the SO_2 case was unparalleled during the thermal interpretation and application effort. EPA and its predecessor, the Interior Department, consistently encouraged TVA to design its Browns Ferry and Sequoyah plants to meet the most stringent thermal standards possible. In so doing they effectively required TVA to install auxiliary cooling systems such as towers at these plants. Moreover, despite the absence of a sufficient data base for promulgating its technology-based effluent limitations, EPA maintained and communicated to TVA a consistent posture toward requiring closed-cycle cooling towers as the best practicable control technology for obtaining its discharge permits. EPA's steadfast positions on issues such as these offered scant hope that its interpretations could, with patience, be reversed. Nor did they invite the opprobrium of those hostile to their substantive decisions concerning thermal pollution.

Enforcement Credibility

Juxtaposing the two application experiences also suggests that the likelihood of EPA enforcement also conditioned TVA behavior. Especially important on this dimension were differences in both the enforcement sanctions provided by the two statutes and the attitudes of EPA officials toward their appropriateness. EPA was hampered prior to the enactment of

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[4]Walton interview; Neff interview; and Casto interview.

the CAA of 1977 by the limited range of enforcement sanctions provided by the 1970 Act; sanctions that unlike those provided by the FWPCA did not include the application of fines to violators. Interviewees allowed that to pose the draconian threat of closing down TVA plants—the only real sanction available to EPA when dealing with the federal facility—was never seriously considered.[5] EPA could not request, federal courts were not about to order, and TVA would never view as likely, actions so disruptive to the economic and social fabric of the Southeast. Also debilitating to EPA's efforts was the "quiet policy" espoused by national EPA and Justice Department leaders of refusing to file law suits against sister agencies. This enforcement predicament, however, changed in 1977. Congress amended the CAA to add market incentives to EPA's enforcement arsenal; and President Carter's appointees at both EPA and the Justice Department indicated willingness to change the nonlitigation policy of the two agencies. Only at this point did TVA view enforcement likely and look for "someone to surrender to."

EPA's enforcement credibility was in no measure so precarious during the thermal controversy. Under Ruchelshaus the agency had quickly established a tough thermal pollution enforcement reputation; one founded on the standard-setting conference and operationalized by an aggressive court suit strategy. The agency's ability and propensity to seek court-ordered imposition of fines for violations was always taken seriously. What is more, after the FWPCA of 1972 was enacted, TVA officials viewed

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[5]Linton interview; Rivkin interview; and Durning interview.

The NPDES permit system—the heart of EPA's enforcement scheme—as a highly effective compliance mechanism. When the discharge permit system was combined with the likelihood of fines and the Atomic Energy Commission's decision to support EPA's thermal standards, TVA's noncompliance option became untenable. To have challenged either the technology-based standards supporting the permit system or to pursue relief from the AEC's decision would have threatened TVA's power production mission. To absorb fines that TVA rate payers would have to subsidize was politically infeasible.

Intergovernmental Task Assignment

A sixth factor influencing TVA's behavior concerns differences in the assignment of implementation tasks to various levels of government. The organizational infrastructure (i.e., the specification of units and methods for implementing policy) provided by the CAA assigned initial enforcement responsibility to the states. Alabama, Kentucky, and Tennessee opted for a permit system as the cornerstone of their enforcement effort. However, TVA as a federal facility refused to apply for state permits citing the Supremacy Clause of the U.S. Constitution as its basis for refusal. Court suits were immediately filed against TVA by Alabama and Kentucky. While differing opinions in the two cases were reconciled by the Supreme Court in TVA's favor, Congress stipulated in the 1977 amendments that federal facilities had to file for state permits. Whether motivated by principle or by a desire to further impede implementation of the CAA, TVA's challenge of the state permit system seriously prolonged resolution of the SO_2 dispute. Not only was delay inherent

when, as expected, TVA's recalcitrance was challenged in court by Kentucky and Alabama. The challenge itself fueled the frustration and hardened the bargaining positions of EPA and environmental groups, and thus made resolution of the dispute more difficult.

Because administration of the NPDES permit system was assigned to EPA rather than the states by the FWPCA of 1972, TVA had no arguable basis for a similar challenge during the thermal dispute. When questioned about TVA's abbreviated and unsuccessful attempt to claim exemption as a federal facility during that episode, one interviewee responded: "the [FWPCA] was much clearer on the duties of federal facilities than the Clean Air Act was," and "we raised the issue briefly, but . . . I don't think they [the TVA legal staff] really thought they had a case."[6] The absence of a challenge on this basis helped attentuate interagency antagonisms and made for a less confrontational negotiation atmosphere; one more conducive to compromise and expeditious resolution of issues.

Sociopolitical Environment

Analysis also reveals the importance of differences in the socio-political environment surrounding the two application experiences. As EPA interpreted and applied its SO_2 policies, acute oil shortages and economic stagflation plagued its efforts. Environmental regulations were relentlessly attacked as inflationary and as detrimental to the energy independence goal enunciated by the Nixon and Ford administrations.

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[6]Morris interview.

Pressure mounted to relax these standards, with even the executive branch of the federal government divided against itself over the proper balance of environmental, economic, and energy values. The Federal Power Commission, the Commerce Department, and the Federal Energy Administration pressured EPA to interpret the 1970 Act as requiring only intermittent controls such as TVA's SDEL program. EPA responded by encouraging the states to eliminate "overly stringent" regulations from their implementation plans. Tennessee and Alabama, in turn, responded with proposals to relax SO_2 emission limits around TVA plants; and Kentucky proposed to allow intermittent controls. While both proposals were subsequently rejected by EPA, the agency's disapproval was uncertain until the last minute. These activities all played an important role in conditioning TVA's behavior in the SO_2 dispute. First, they offered hope to TVA that challenges to EPA's efforts might, with patience, prevail. Secondly, they afforded TVA an abundant supply of highly sympathetic, strategically placed, and stridently vocal allies on the issues involved. Most importantly, these were sympathizers who actively promoted intermittent control systems within the executive office of the president, before administrative agencies, and in the Congress.

In contrast, as EPA implemented its thermal policy the nation's interest in the heat discharge problem was peaking. Throughout the late sixties and early seventies, environmentalists had successfully raised thermal pollution concerns in a number of nuclear plant siting and operating court cases, most notably the Calvert Cliffs, Florida Power and Light, and New York Con Edison decisions. Successful legal challenges

had also raised the thermal pollution consciousness of Congress. In 1970, it enacted amendments to the FWPCA that sought to rectify confusion over who had jurisdiction over nuclear plant heat discharges; and in the FWPCA of 1972, Congress enacted sweeping changes in the organizational infrastructure for controlling thermal pollution. Thus, while interest in air pollution waned and attacks on its regulation mounted during the SO_2 dispute, interest in thermal pollution intensified during the thermal controversy. Produced was a much more favorable implementation environment for thermal pollution; one that discouraged, rather than encouraged, TVA recalcitrance.

Dispositions of the Actors

Finally, differences in the attitudes of the actors involved in the cases help account for TVA's divergent behavior. First, it appears that differences in EPA's confidence in its thermal and SO_2 policies were critical in doing so. Secondly, differences in Chairman Wagner's attitudes toward air and water pollution in general, and SO_2 and thermal pollution control technologies in particular, greatly affected TVA's responses. EPA's lack of confidence in dealing with TVA on the SO_2 issue stemmed from the agency's perception that TVA was the "international expert" on air pollution and scrubber technology.[7] As one EPA official remarked, "We weren't sure we were doing the right thing; they came in with their modeling flow charts and their data on scrubber technology

[7]Traina interview; Linton interview.

problems, and we just couldn't match it at that time."[8] Another lamented TVA's presumed surfeit of expertise and its effect on EPA's enforcement strategy: "We could only hang in there and say 'you're violating the law.'"[9] When this attitude is coupled with Administrator Ruchelshaus' statements that "definitive data" supporting SO_2 national ambient air standards (NAAQS) were unavailable, much of EPA's early timidity in applying the law to TVA is understandable. So too, in part, is TVA's laggard response.

In contrast, EPA exuded confidence and professionalism in applying thermal policy to TVA. This can be attributed to the agency's long "track record" in the water quality arena and to the validity of the causal theory underlying the thermal problem.[10] Moreover, several interviewees suggested that this "professionalism" translated into a more "reasonable" implementation attitude on EPA's part when compared with its posture in the SO_2 dispute.[11] This reasonableness, in turn, provoked the TVA general manager to recommend that a more conciliatory TVA attitude in the thermal, rather than the SO_2, dispute was warranted.[12]

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[8]Raven interview.

[9]Traina interview. Similar thoughts were offered by Marvin Durning, EPA Deputy Administrator for Enforcement; Dean Hill Rivkin, Citizen Group Attorney; and Attorney James Bycott, EPA Region IV.

[10]Traina interview.

[11]Brye interview; Morris interview. These men were highly laudatory of EPA's attitudes and behavior during the thermal dispute.

[12]Memorandum from G. F. Stone, TVA, and W. R. Nicholas, Assistant Chief, TVA Water Quality Branch, to J. A. Oppold, TVA, January 23, 1974.

Equally important in conditioning TVA's behavior were differences in the attitudes of Board Chairman Wagner toward air and water pollution, as well as toward SO_2 and thermal control technologies. Indeed, some speculated that these differences made the Chairman's opposition to towers less truculent and uncompromising than his opposition to scrubbers, thus abbreviating the thermal dispute.[13] TVA had long been concerned with water quality. Commencing with its establishment of a stream sanitation program in the mid-thirties, through its involvement in the development of water pollution control legislation during the forties, and its studies on the effects of heat discharges at its coal-fired plants in the fifties and sixties, the agency's commitment was unassailable. Chairman Wagner, because of his long association with the agency, was quite comfortable with a stewardship role that saw water quality as the lever for the "optimum use and future economic development of the Valley's streams and reservoirs." Thermal pollution, according to one interviewee, threatened these goals: "Dead fish floating on the water simply weren't conducive to [these goals]."[14]

In contrast, the problems that environmentalists and some health professionals associated with SO_2 pollution were less visible, less immediate, and less attributable to TVA operations. What is more, Chairman Wagner was "more skeptical" about those effects and the control technologies associated with them. TVA's heralded air pollution modeling and its experience with experimental scrubbers, he maintained, gave little support to the contentions of environmentalists.

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[13]Traina interview. [14]Ibid.

Implications for Policy Implementation

What are the implications of the SO_2 and thermal pollution control disputes for policy implementation in general? Obviously, one must exercise care in generalizing from the particulars of a comparative case study to the "universe" of implementation experiences. The external validity caveats associated with doing so are well-known and well-founded.[15] Still, as Arendt Lijphart suggests, there is substantial merit in attempting to relate one's findings to those of previous research: on the one hand, case studies can strengthen widely accepted propositions should their findings be consistent with them; if inconsistent, the cases can suggest "modified proposition[s] that may be stronger."[16]

The EPA/TVA cases clearly add credence to the dominant metaphors of the implementation literature. Once more implementation appears to be a bargaining process where policy is negotiated with, rather than dictated to, target populations; where the behavior of those targeted is predicted on a rational pursuit of self-interest; and where a circular bargaining process can develop, with participants striving to affect implementation in whatever forum and at whatever stage of the policy process deemed necessary. The cases also reinforce the specific findings of previous implementation research, as well as suggest refinements to, and

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[15]See, for example, Hugh H. Heclo, "Review Article: Policy Analysis," British Journal of Political Science 2 (January 1972): 93.

[16]Arend Lijphart, "Comparative Politics and the Comparative Method," American Political Science Review 65 (December 1971): 692.

amplifications of, some of its more well-known propositions. The specifics of these implications follow. For consistency, the classificatory scheme used in Chapter I to review prior implementation findings is used to organize this discussion as well. Thus, the findings of the EPA/TVA cases are related to the three analytically distinct sets of factors identified in previous research as conditioning implementation: organizational, technoscience, and sociopolitical.

Organizational Factors

Three of the most significant factors found to condition implementation in prior research have been organizational mission, complexity of joint action, and dispositions of actors. The EPA/TVA cases tend to both support and suggest major refinements or amplifications to the conventional wisdom associated with each of these variables. They also tend to directly support that of a fourth factor typically associated with organizational behavior: the communication of policy. A fifth factor, anticipation of future agency interaction, seemed to have little effect in either dispute. Let us now consider each of these factors in some detail.

1. Policy/Mission Proximity. Most studying implementation imply that if implementing or target population officials subscribe to a mission inconsistent with, alien to, or hostile toward a particular policy, long-term delay in implementing that policy is likely. Some have refined this notion, suggesting that the more a policy impinges on or threatens the ability of an agency to realize its mission, the less

likely that agency is to either effect or comply with it in the short term. While intuitively appealing, this generalization requires modification given TVA's behavior in the two cases. The agency complied much quicker with the policy that directly threatened its mission than with the one that did not.

Recall that in the thermal case EPA sought to apply a policy to TVA that if not expeditiously complied with, would have directly threatened the latter's power program mission. Identifiable in the agency's technical programs, procedures, and decision premises, the ultimate aim of the TVA power program was to produce sufficient quantities of electricity, at the lowest possible cost, to meet the power needs of the Tennessee Valley. To do this, TVA had committed itself to having nearly 55 percent of its total generating capacity dependent on nuclear power by 1985. Given the long and ever lengthening lead times needed to get nuclear plants into operation, TVA officials felt they could not sustain licensing delays and still meet the projected power demands of the Tennessee Valley. Thus, when the AEC incorporated EPA's thermal standards as a condition for issuing operating licenses for Browns Ferry and Sequoyah, TVA complied in relatively short order. Agency officials felt they could not afford to jeopardize the power supplies of the entire Southeast region by continuing to challenge thermal standards and by holding up the construction of cooling towers.

In contrast, sanctions for violating SO_2 policy were never viewed as mission threatening by TVA; no one seriously believed that EPA would close down violating coal-fired steam plants. Moreover, the delay

caused by TVA challenging SO_2 policy was an asset rather than a mission threatening liability to the agency. The longer TVA remained in noncompliance, the more time was available for SO_2 policies to be relaxed by sympathetic political and administrative actors. Moreover, as the agency's nuclear plants came on-line in the interim, SO_2 emissions from its coal plants would become less of a problem anyway.

Clearly, juxtaposing the two cases in this manner suggests a major refinement of the conventional wisdom surrounding policy/mission proximity and its relationship to implementation delay. As noted, prior research indicates that policies affecting an agency's mission only tangentially, or not at all, are the easiest to implement. Conversely, policies directly affecting that mission are said to be the most difficult to implement. The EPA/TVA cases suggest, however, that implementation may sometimes be facilitated when policies jeopardize the ability of an agency to realize its mission. Consequently, it might be more accurate to expect less delay not only when implementing policies that indirectly or tangentially affect an agency's mission, but also when implementing those that directly affect the realization of agency goals. Prolonged implementation delay might instead be expected in that admittedly nebulous zone twixt these two extremes.

2. Complexity of Joint Action. One of the more widely heralded factors said to condition implementation is the complexity of joint action involved. As used by researchers, this concept refers to the number of individuals external to the implementing agency and target populations whose agreement with a policy must be secured in order for

that policy to be implemented. Delay is reputed to be the usual price of obtaining this ultimate agreement among external actors. Delay is said to be a "function of the number of decision points, the number of participants at each point, and the intensity of their preferences." Typically, it is argued that the more decision points and participants there are, and the more negative their views toward a policy, the longer implementation delay. The EPA/TVA cases suggest a major refinement of this argument. Considering only the number of external veto points and the number of actors involved, and assessing only the direction and intensity of their attitudes is insufficient when analyzing policy implementation. One must look additionally to the type of clearance point, as well as to the potential impact of the delay posed by their number and kind, on the mission of target populations. These may be equally powerful predictors of compliance. As the cases demonstrate, the complexity of joint action, contrary to the conventional wisdom, can actually enhance policy implementation.

The importance of the type of clearance point was aptly illustrated in both cases. For example, EPA's efforts to apply SO_2 policy to TVA were hindered by the number of negatively disposed participants who, through the Quality of Life Review Process, could actually modify SO_2 regulations. While NEPA allowed the same actors to become involved in the thermal dispute, it did not allow them, in effect, an institutionalized veto power over EPA's decisions. Thus, unlike the SO_2 case, TVA entertained no illusions that EPA's interpretation of thermal policy would be relaxed by the OMB. Consequently, one major incentive for the

agency to delay compliance was removed. Similarly, there was no comparable veto point in the SO_2 case to compare with the AEC's power to deny operating licenses to TVA's nuclear plants. The only thing resembling it was the state permit system for operating coal-fired plants; and that was rendered virtually innocuous for dealing with TVA until the 1977 amendments to the Clean Air Act.

Because most studying implementation have paid scant attention to regulatory policies, and because they have viewed the complexity of joint action from the perspective of those effecting policy, they have failed to appreciate the problems it can present to target populations. The EPA/TVA cases, when viewed from these less investigated perspectives, suggest how implementation can be accelerated, rather than impeded, by such complexity. Both cases provided a variety of clearance points; ones that prior research would lead us to expect might delay implementation. As noted, however, TVA's ability to sustain delay and still realize its power production mission varied dramatically between the disputes. In the thermal episode TVA saw the delays inherent in the complexity of joint action as jeopardizing its power production responsibilities. Thus, it discouraged Professor Parker's sympathetic intervention in the AEC licensing process and failed to pursue redress from the AEC, other federal agencies, the Congress, or the courts. In contrast, the agency encouraged, willingly accepted, and actively engaged in such challenges throughout the SO_2 affair. It could do so because the delays imposed in no way threatened its ability to produce sufficient quantities of electricity for its service area. Thus, the

more a target agency views the delays inherent in the complexity of joint action as detrimental to its mission, the less likely prolonged implementation delay will occur.

3. Dispositions of Actors. The third organizational factor for which the EPA/TVA cases suggest modifications concerns the dispositions of actors involved in the implementation experience. Researchers have found that two aspects of these attitudes are critical. First, actor attitudes toward the policy itself, and toward the technical and legal issues surrounding it, can condition implementation. Second, their attitudes toward enforcement resources or sanctions can seriously affect compliance with that policy. In regard to the former, it is expected that the less positively disposed officials are toward a policy, the more implementation will be lax or challenged, and the more prolonged implementation delay will be. From the latter, one expects that if target populations perceive enforcement sanctions as weak, or implementors reluctant to use them, the more likely is long-term implementation delay. While this study has again demonstrated the importance of these factors and the validity of the conventional wisdom surrounding them, it also suggests an additional attitudinal component. At least in the intragovernmental arena, values that transcend attitudes toward particular policies, or toward narrow technical and legal questions surrounding them, can condition implementation. Equally important can be the attitudes of actors toward the more nebulous, more philosophical issues of the proper role and behavior of public agencies in our society.

Perhaps the value most instrumental in resolving the EPA/TVA air pollution dispute was the notion that TVA was, and as a federal facility ought to be, "more than just another power company." After the two Freemans replaced Wagner and Jenkins on the TVA Board, and after Durning joined EPA, a new philosophy concerning TVA prevailed in both agencies. TVA, as the holder of a public trust, had a moral as well as a legal duty to comply with both the spirit and the letter of pollution control statutes. It should, as a public agency, become a compliance model or "yardstick" for the private sector; a beacon demonstrating how competing environmental and energy concerns could be reconciled. This philosophy contrasted sharply with Chairman Wagner's attitude about the role of TVA in contemporary society. He also saw TVA as the holder of a public trust; and he too relished the idea that TVA was more than a power company since its purpose was to serve as a yardstick for the private sector. But he saw the agency's obligation to the public interest in a very different light from his successors. He saw it as one demanding that TVA challenge the implementation of "unwise" policies, rather than comply perfunctorily with them merely because the agency was part of the federal family. Precisely because TVA was a public agency, and because its compliance with SO_2 policy would be used as an example to bring pressure on the utility industry to comply, Wagner felt compelled to fight EPA's efforts.

4. Policy Communication. The EPA/TVA cases substantially support the salience of the precision in which policy is communicated from Congress to implementing agencies. As the implementation literature

leads one to expect, the statutory ambiguity of both the CAA and FWPCA spawned interpretation problems for EPA; problems that subsequently complicated its application efforts as well. Most telling for the SO_2 and thermal disputes was the imprecision of language concerning standard-setting and control technologies. Researchers also aver that the manner in which implementors communicate their interpretations of statutory language can affect implementation. Certainly, the EPA/TVA disputes support the conventional wisdom that the more confusing, logically inconsistent, or vacillating this communication becomes, the more likely prolonged implementation delay. The vacillation accompanying EPA's tortuous two and a half year struggle to resolve the constant versus intermittent control question was a major factor affecting TVA's noncompliance with SO_2 policy. EPA's inconsistency in this instance contrasts sharply with the agency's persistent, unyielding performance in the thermal case; a performance that left little hope that the agency would soon come around to TVA's way of thinking on thermal policy.

Technoscience Factors

Those studying implementation have also noted the capacity of scientific and technical factors to condition the process. They suggest that the more controversial the theory underlying a policy, the more likely it will be challenged, and the greater the probability that delay in its implementation will result. Similarly, they maintain that if specialists in the policy field disagree over techniques for best achieving policy goals, implementation delay can be expected. The

EPA/TVA cases both support these generalizations and suggest an amplification of them.

In terms of supporting the propositions, the causal theory underlying SO_2 and thermal pollution control, as well as the techniques for controlling the two problems, helped to define the nature, tone, and duration of the two disputes. Both the causal theory underlying, and the control techniques associated with, SO_2 pollution were definitely more controversial. And as the literature leads us to expect, TVA consistently raised questions about each during EPA's attempt to apply the policy to the agency. Challenged were the basic cause/effect relationships between SO_2 and respiratory health hazards, as well as the ability of untested constant control systems to effectively control the pollutant in an environmentally safe way.

Given the widely acknowledged link between heat discharges and fish kills, as well as the unquestioned capabilities of cooling towers, the thermal dispute was waged more in terms of <u>how much</u> heat and <u>which</u> of two viable control techniques. What is more, EPA's publicized uncertainty as to what adequate SO_2 standards might be, and its early doubts as to the efficacy of constant controls, caused some agency officials to question whether they "were doing the right thing" in pressing for TVA compliance. This lack of confidence explains in part EPA's "reluctance to go to the mat" with TVA in these years;[17] a lack

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[17]The phrase "reluctance to go to the mat" with TVA comes from the Rivkin interview.

of confidence unparalleled in the thermal case where the agency dealt with more established theory and control technologies.

As for the amplification of prior research, the two cases suggest that uncertainty over theory and disagreement over techniques do more than provide credible reasons for challenging implementation. They also shorten or prolong implementation delay by defining the nature and tone of negotiations. Should agreement exist on fundamental questions concerning whether policies or techniques will work if applied, the more amenable to compromise negotiators will tend to be, and consequently, the less likely implementation delay will be prolonged. Because of basic agreement on these issues during the thermal episode, interagency talks were more professional, less confrontational, and more amenable to compromise. This, in turn, helped facilitate a relatively swift resolution of the interagency disagreements over thermal pollution control. In contrast, disagreement over the same threshold questions during the SO_2 dispute only hardened the bargaining positions of the two agencies. Negotiations between technocrats over technical adjustments were replaced by adversarial confrontations between legal staffs over what constituted the letter and spirit of the law.

Sociopolitical Factors

Those studying policy implementation counsel that this process is especially vulnerable to changing public attitudes and shifting political agendas. Three expectations arise concerning the ability of the socio-political environment to condition implementation. First, both implementators and target populations will attempt to mobilize those

elements in society who are sympathetic to their respective views on the policy in question. Secondly, the more incongruous a policy is with the current political agenda, the more difficult it will be to effect since political allies willing to challenge it will be more abundant. Finally, each participant will consider the mobilization potential of itself and its counterpart in deciding courses of action during implementation.

The EPA/TVA cases tend to support the thrust of these generalizations, but with one significant refinement. Most studying public policy tend to view those sympathetic to challenging policy as assets to a target population; assets that are available for mobilization by these targets in order to thwart implementation. The thermal episode suggests that the availability of these actors is a necessary, but hardly sufficient condition for mobilization. One must look additionally to the effect of such challenges, if mobilized, on the ability of the target agency to realize its mission. Certainly, in the SO_2 case TVA did little to dissuade the intervention of both private and public sector actors on its behalf. Indeed, TVA's four-pronged campaign to promote its SDEL program was specifically designed to activate such actors. During the thermal controversy, however, TVA actively discouraged the intervention of individuals such as Frank Parker who were sympathetic to the agency's cause. Unlike the SO_2 controversy, TVA feared that such interventions might delay the issuance of licenses to its nuclear plants and consequently jeopardize the agency's ability to meet its power generation responsibilities. A refinement of the conventional wisdom is thus suggested. A target agency will attempt

to mobilize allies sympathetic to its cause when to do so does not threaten that agency's ability to realize its mission.

The Policy Implementation Dilemma and Its Prospects for the Administrative State

The second set of research questions posed at the beginning of this study probed the implications of intragovernmental policy implementation for the administrative state. They arose from the speculation of several scholars that federal agencies would typically be less able to hold sister agencies, as opposed to subnational or private sector actors, accountable to the laws of the land. What do the EPA/TVA cases suggest about the ability of one national bureaucracy to change or modify the behavior of another as part of its implementation responsibilities? What do they indicate about bureaucratic accountability in contemporary society? What are the implications of the policy implementation dilemma for the public interest? Given the paucity of research in this area, one cannot say with certainty that these cases are typical of the "universe" of intragovernmental policy implementation experiences. Nonetheless, as examples of the process they do afford some insight into questions such as these. The following discussion, while speculative at best, is offered in the hope that it might encourage further research on these topics.

Can It Work?

The EPA/TVA cases suggest that federal agencies are, or at least can be rendered, vulnerable to the policies of other federal agencies.

They demonstrate that these bureaucracies can be no more or no less vulnerable to public regulation than any other target population; this since many of the same factors found to condition implementation in other contexts are powerful in the intragovernmental arena as well. The cases also indicate, however, that these agencies can be made especially vulnerable to public regulation if Congress or the president so desire. This can be done in three ways. First, the chief executive can, through the appointment power, place individuals sympathetic to policy implementation in strategic positions at appropriate agencies. Perhaps the most convincing demonstration of the conditioning power of the appointment process was the role President Carter's appointees at TVA, EPA, and the Justice Department played in resolving the SO_2 dispute. Obviously, this mechanism for resolving implementation conflict is unavailable when national bureaucracies must deal with subnational and private sector actors. The availability of the appointment power in this arena thus makes federal bureaucracies distinctly vulnerable to public regulation under two circumstances: when opportunities for appointments arise, and when presidents choose to appoint individuals anxious to resolve implementation difficulties.

Federal agencies can also be effectively held to regulatory goals through adroit, timely, and indirect intervention by the president and his emissaries. For example, the legacy of executive orders stating the obligation of federal facilities to comply with water pollution laws definitely aided EPA's application of thermal policy to the TVA. Similarly, President Carter, while avoiding overt involvement in the

controversial SO_2 dispute, created a climate of compliance expectations regarding federal facilities and air pollution laws. Through executive orders, State of the Union messages, the OMB review process, and public statements about TVA's new energy and environmental roles, the President placed pressure on TVA to comply with the Clean Air Act. Most importantly, he did so without risking the scarce political capital that is normally jeopardized when presidents become involved in a "substantial and continuing manner" with such divisive policy questions.[18]

Thirdly, Congress can make federal agencies especially vulnerable to intragovernmental policy implementation by enacting legislation that compensates for flaws in the organizational infrastructure of implementation. For example, Congress compensated for the reputed reluctance of federal officials to implement environmental policy when it incorporated citizen enforcement lawsuit provisions in both the CAA and FWPCA. Moreover, when both the enforcement sanctions provided by the CAA of 1970 and its ambiguous language dealing with control technology and federal facility compliance threatened to undermine implementation, Congress amended the Act to remedy these situations.

Certainly, there is no guarantee that the positions of implementors such as EPA will be supported by any given president or congress. What is more, target agencies such as TVA can mobilize influential political actors who share their aversion to implementation at myriad points throughout our decentralized federal system. Nonetheless, the cases

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[18]Wilson and Rachal, "Can Government Regulate Itself?," 13.

still demonstrate that caution must be exercised before dismissing intragovernmental policy implementation as a largely unworkable process as some have done.

Toward Bureaucratic Oversight?

Political scientist Emmette Redford has written that the traditional literature on politics and administration offers an overhead democracy model of how the administrative state should operate. This model reflects the notion that the democratic control of administration requires political supremacy: administration "should be subordinate to political direction, and supervision exercised through law and hierarchical oversight."[19] At the national government level, the primary structural mechanism for operationalizing hierarchical oversight is the highly decentralized committee system of the U.S. Congress. Ideally, congressional committees "review and control policy implementation by the agencies and officials of the executive branch."[20] Legislative oversight, however, has been roundly criticized by some as inadequate given its episodic nature.[21] Because the institutional and political rewards for oversight are normally so fleeting, the Serbonian Bog of agency activities often so impenetrable, and the resources of individual legislators so severely limited, congressional oversight of the executive

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[19]Redford, Democracy in the Administrative State, p. 70.

[20]Dodd and Schott, Congress and the Administrative State, p. 156.

[21]See, for example, Seymour Scher, "Conditions for Legislative Control," Journal of Politics 25 (August 1963): 526-551; and John S. Saloma, Congress and the New Politics (Boston: Little, Brown and Company, 1969), pp. 140-151.

branch is said to be minimal and sporadic. Others are less harsh in their assessments, noting that when informal means of oversight—such as constituency case work—are considered, legislative oversight is more constant and pervasive than most assume.[22] Certainly, the EPA/TVA cases cannot resolve this debate. They do, however, suggest that the new social regulation policies enacted by Congress over the past decade have added a new dimension to the oversight of administrative activities. They have, in effect, created what might be termed "bureaucratic oversight" of executive branch activities.

When enacting laws of the social regulation variety, Congress often specifically charges one federal agency with holding sister agencies accountable to their provisions. In effect, one bureaucracy oversees the activities of another. As Rourke notes, agencies such as the Environmental Protection Agency function as "adversary bureaucracies—set up to bring the decisions and actions of other agencies under greater scrutiny and to deter them from malpractice" in a specific policy area.[23] The EPA/TVA cases demonstrate, however, that these bureaucracies often meet with difficulty in carrying out this function. Competing, even mutually exclusive, policy goals of the two agencies must sometimes be reconciled. In the process, a contest can arise over which goal prevails, in what form, and in whose interest.

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[22]See, for example, Michael W. Kirst, Government without Passing Laws (Chapel Hill: University of North Carolina Press, 1969).

[23]Francis E. Rourke, Bureaucracy, Politics, and Public Policy, 2d ed. (Boston: Little, Brown and Company, 1976), p. 177.

While the existence of interagency contests have been recognized, their implications for overhead democracy have been largely overlooked. As the two adversaries work out their differences, the scope of the conflict can expand to include private citizens, members of the respective subsystems of the two agencies, and sometimes even the president or his immediate staff. Moreover, contrary to what Rourke implies, the scrutiny of elected officials and private citizens is not limited solely to compliance with a given social policy. Because social regulation policies typically affect all aspects of a target agency's operations, all facets of its activities become fair game for investigation. For example, because of the SO_2 dispute TVA repeatedly testified before congressional committees to plead its case for intermittent controls. But in doing so it was forced to publicly respond to the allegations of agency critics on such varied topics as its rate structure, bonded indebtedness, personnel policies, and nuclear plant construction problems.

James Madison once wrote that the best way to prevent governmental tyranny is to pit the separate branches of government against each other: "Ambition must be made to counteract ambition."[24] Over two hundred years later, it is the tyranny of the expert, unelected bureaucracy over the political master turned dilettante that most animates popular concern. It appears from this study of intragovernmental policy implementation that Madison's prescription can help

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[24]James Madison, "Federalist 51," in The Federalist Papers, eds. Alexander Hamilton, James Madison, and John Jay (New York: The New American Library of World Literature, Inc., 1961), p. 322.

assuage this contemporary concern as well. Bureaucratic oversight, in effect, pits the ambitions of one federal agency against those of another. In doing so it can increase the involvement of elected representatives in all aspects of bureaucratic activity, and allow those officials to delimit the scope of administrative discretion when they feel it appropriate. What is more, bureaucratic oversight provides an opportunity for elected, rather than appointed, public officials to correct for the unanticipated consequences of our disjointed policy-making process. Consequently, while it is perhaps no less episodic nor sporadic than traditional oversight methods, bureaucratic oversight appears a significant aid to overhead democracy.

The Dilemma and the Public Interest

The policy implementation dilemma posed when one federal agency is legally charged with holding another accountable to public policy also raises issues relevant to the public interest. The internecine conflict that can accompany intragovernmental policy implementation is typically excoriated by policy advocates and academicians alike as contrary to the public good. Some legitimately ask how government can expect the private sector to comply with public policies if members of the federal establishment refuse to abide by them. Federal facility noncompliance is viewed as a public embarrassment; one that allows the private sector to avoid public control by arguing that government should get its own house in order before requiring others to comply with policies. Others cite the difficulties of implementing policies in the intragovernmental arena as

justification for limiting the expansion of the public sector.[25] The EPA/TVA cases suggest, however, that the problems associated with implementation in the intragovernmental setting can have positive benefits as well. Indeed, they give one pause to ask if the public interest is not also served to a degree by the obstacles to implementation that can arise in these circumstances.

Whether principled or obstructionist in nature, challenges to implementation can do several things. First, they can bring the sustained attention of elected officials to bear on the unanticipated consequences of public policies; attention that less renowned target populations might not be able to arouse. Secondly, challenges allow elected, rather than appointed, officials an opportunity to rethink, perhaps even reconcile, conflicting policy goals in the light of experience; an opportunity that our highly decentralized legislative process seldom affords. Thirdly, the broadened scope of conflict that these challenges can engender may bring a breadth of interest representation and values to the policy-making and oversight process seldom provided in Congress. Finally, since no one bureaucracy has a monopoly on virtue or knowledge, challenges can correct for the mistakes made by implementors in applying policies to target populations.

It is thus arguable that the interagency tension stimulated by intragovernmental policy implementation is not necessarily as dysfunctional as commonly assumed. In a political system attempting to cope with problems as complex, little understood, and costly to resolve as

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[25]Wilson and Rachal, "Can Government Regulate Itself?," passim.

our own, agency challenges to the advisability of policies are likely unavoidable. When this precariousness of policy is combined with a legislative process inimical to considering the interrelatedness of problems or policies, they can sometimes be desirable. Indeed, given the untoward, unexpected consequences that sometimes arise when policies interact, they may spare us the lament of Goethe's Faust to Lynceus the Watchman: "What plaintif notes are these that reach me from above, reach me too late to be of use."[26]

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[26]Goethe, Faust, trans. Barker Fairley (Toronto: University of Toronto Press, 1970), p. 193.

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