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DISSERTATION

ANALYZING POLICY CHANGE:
THE GREENING OF THE DEPARTMENT OF ENERGY

Submitted by
Kyle Gardner
Department of Political Science

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Ft. Collins, Colorado

Spring 2001

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ABSTRACT

ANALYZING POLICY CHANGE: THE GREENING OF THE DEPARTMENT OF ENERGY

Policy change has become an increasingly important topic in political science. Analyzing policy change is important not only for illustrating the evolution of a particular policy issue, but also for explaining larger changes in the American political process. Recent work by a variety of scholars has focused on the issue of policy change, and particularly, changes in previously stable policy monopolies (Baumgartner and Jones 1991, 1993, Bosso 1987, Sabatier and Jenkins-Smith 1993, Thurber 1991). This paper applies a model of policy change to examine how the Department of Energy (DOE), a key element of the U.S. defense establishment, came to comply with environmental protection policies after decades of neglect.

During the Cold War (1946-1991), the primary mission of the DOE and its predecessor agencies (in particular the Atomic Energy Commission) was the production and testing of nuclear weapons. These activities occurred at a number of sites and facilities scattered across the country and were conducted with little regard to environmental, safety, or health concerns. Despite the emergence of a number of environmental statutes that contained explicit provisions covering federal facilities, the AEC and DOE maintained a policy of self-regulation. These policies resulted in widespread environmental contamination at dozens of facilities across the country.

Environmental protection at nuclear weapons production sites was practically nonexistent from the 1940s until the 1980s. Within a short period of time, the federal government was compelled to adopt environmental protection policies and embark on environmental restoration and site cleanup. The cleanup activities are characterized by openness with the public and outside regulators, and the inclusion of players previously excluded from the policymaking process. Explaining how this rapid turn of events came about is the subject of this paper.

This paper will examine nuclear weapons production policy change using a model proposed by Baumgartner and Jones (1993). The authors argue that the interaction of policy images (the ideas and values concerning a policy) and the venues of policy action (institutions which have policy making authority) can lead to rapid policy change even after years of stability. This study will employ a variety of data to examine the interaction of image and venue, along with the events and processes that created, maintained, and ultimately led to the collapse of the nuclear weapons production policy monopoly.

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TABLE OF CONTENTS

Abstract	iii
Illustrations: Figures and Tables	vi
Chapter I: Our Own Worst Enemy	8
Chapter II: Policy Change, Review of the Literature and the Punctuated Equilibrium Model	26
Chapter III: Testing the Punctuated Equilibrium Model: Hypotheses And Research Design	57
Chapter IV: Creation and Maintenance of the Nuclear Weapons Production Policy Monopoly, 1945-1969	82
Chapter V: The Emergence of Opposition and Early Policy Changes, 1970-1985	136
Chapter VI: Policy Monopoly Disintegration and Transformation, 1986-1994	202
Chapter VII: Conclusions and Summary	268
Bibliography	299
List of Abbreviations	315

ILLUSTRATIONS

Tables	Page
Table 4.1: Number of Nuclear Weapons in the U.S. Arsenal, 1945-1970	104
Table 5.1: Major Federal Legislation, 1969-84	138
Table 5.2: House Jurisdiction, 1977	148
Table 5.3: Senate Jurisdiction, 1977	148
Table 5.4: Hearings by Committee, 1970-85	151
Table 5.5: Congressional Action on Nuclear Weapons Production Policy	156
Table 5.6: Major Events in the Weapons Production Complex, 1970-1985	159
Table 5.7: State-Level Venue Succession Events, 1970-1985	172
Table 5.8: Policy Reformers and Nuclear Weapons Production Policy	175
Table 5.9: Nuclear Weapons Production Policy Litigation, 1970-1985	192
Table 6.1: Hearings by Committee, 1986-1994	215
Table 6.2: Distribution of Hearings, Federal Facilities Compliance Act	217
Table 6.3: Comparing the Distribution of Witnesses Between Two Time Periods	219
Table 6.4: Nuclear Weapons Production Sites, National Priorities List and Interagency Agreements	226
Table 6.5: Environmental Component of Department of Energy Annual Budgets, FY1978-2000	246
Table 6.6: Nuclear Weapons Production Policy Litigation, 1986-1994	253

Figures

Figure 1.1: Nuclear Weapons Production Complex	11
Figure 5.1: Congressional Hearings, 1970-85	150
Figure 5.2: Topics of Congressional Hearings, 1970-85	152
Figure 5.3: Distribution of Witnesses, 1970-1985	155
Figure 5.4: <i>New York Times</i> Attention, 1970-1985	161
Figure 5.5: <i>New York Times</i> Tone, 1970-1985	162
Figure 5.6: <i>Reader's Guide</i> Attention, 1970-1985	163
Figure 5.7: <i>Reader's Guide</i> Tone, 1970-1985	163
Figure 5.8: <i>Denver Post</i> Attention, 1970-1985	165
Figure 5.9: <i>Denver Post</i> Tone, 1970-1985	166
Figure 5.10: <i>Cincinnati Enquirer</i> Attention, 1970-1985	167
Figure 5.11: <i>Cincinnati Enquirer</i> Tone, 1970-1985	168
Figure 5.12: <i>Seattle Times</i> Attention, 1970-1985	169

Figure 5.13: <i>Seattle Times</i> Tone, 1970-1985	169
Figure 6.1: Congressional Hearings, 1986-1994	212
Figure 6.2: Topics of Congressional Hearings, 1986-1994	214
Figure 6.3: Distribution of Witnesses, 1986-1994	218
Figure 6.4: General Accounting Office Reports, 1986-1994	221
Figure 6.5: Department of Energy 2010 Report Budget Projections	230
Figure 6.6: <i>New York Times</i> Attention, 1986-1994	259
Figure 6.7: <i>New York Times</i> Tone, 1986-1994	260
Figure 6.8: <i>Reader's Guide</i> Attention, 1986-1994	260
Figure 6.9: <i>Reader's Guide</i> Tone, 1986-1994	261
Figure 6.10: <i>Denver Post</i> Attention, 1986-1994	262
Figure 6.11: <i>Denver Post</i> Tone, 1986-1994	263
Figure 6.12: <i>Cincinnati Enquirer</i> Attention, 1986-1994	264
Figure 6.13: <i>Cincinnati Enquirer</i> Tone, 1986-1994	264
Figure 6.14: <i>Seattle Times</i> Attention, 1986-1994	265
Figure 6.15: <i>Seattle Times</i> Tone, 1986-1994	265

Chapter I: Our Own Worst Enemy

The development, use, and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare, subject at all times to the paramount objective of making the maximum contribution to the common defense and security.

Atomic Energy Act, 1954

We are redirecting the national commitment that built the most powerful weapons the world has ever known, toward addressing the resulting widespread environmental and safety problems at thousands of contaminated sites around the country. We have a moral obligation to do no less, and we are committed to producing meaningful results.

Energy Secretary Hazel O'Leary, 1994

The preceding statements illustrate two vastly different policy worlds. During the Cold War, the development, production, and testing of nuclear weapons occurred within a context shaped exclusively by national security needs that trumped all other concerns. The needs of production, and the secrecy which surrounding nuclear weapons, was coupled with a policy making structure insulated from outside scrutiny, and operating according to self-directed regulations concerning environmental, safety, and health matters.

Until the mid-1980s, the agencies responsible for nuclear weapons production, the Atomic Energy Commission (AEC) until 1974, the Energy Research and Development Administration (ERDA) from 1974-1977, and Department of Energy (DOE) beginning in 1977, resisted the growing environmental protection framework that was emerging at the

federal and state levels of government. Claiming that the special mission of national defense took precedence over environmental protection laws, these agencies, along with their allies in Congress and the private sector, were able to maintain their prerogative of self-regulation. Nevertheless, pressure steadily grew to bring nuclear weapons production activities under environmental protection policy. With the gradual revelation of a massive environmental problem at nuclear weapons production facilities, and questions about how weapons activities might affect public health, a series of rapid policy changes occurred during the 1980s which dismantled the nuclear weapons self-regulation regime and launched the largest ever environmental restoration and cleanup program. The changes that swept through nuclear weapons production policy were well in place before the official end of the Cold War in the early 1990s. Had the Cold War continued for another decade, environmental, safety and health concerns would have played a more important role in nuclear weapons production policy than they had during the previous 40 years.

The rapid and profound changes that overtook nuclear weapons policy during the 1980s were remarkable given the fact that the policy itself had been stable for nearly four decades. Moreover, the fact that “environmentalism” penetrated one of the most secretive and restricted national security policy structures is a testament to the power of ideas in setting policy agendas, and the institutions spawned by them. Perhaps what made the policy change so remarkable was that part of the basis of reform came from grassroots organizations and state governments, political actors who generally do not impinge on national defense policies. Moreover, the policy changes occurred within a larger public

mood of declining trust in government, and the emergence of a confidence gap in political institutions more generally (Lipset and Schneider 1987).

The purpose of this paper is to examine the phenomenon of policy change in nuclear weapons production policy. The research objective of this study is to develop an explanation of the complex factors that created and maintained nuclear weapons policy from its beginnings in World War II through the Cold War, and brought about rapid and profound change after decades of stability. The dynamic factors at work in nuclear weapons policy change involved intense political conflict over policy images, efforts to maintain and reshape political institutions, issues involving public health and trustworthiness of government, the mobilization of grassroots opposition and an increasing activism of state and local governments. It is a complex and important story.

Nuclear Weapons Production Policy and Environmental Contamination

During the Cold War, the Department of Energy (DOE) and its predecessor agencies (the Manhattan Project from 1942-46, the Atomic Energy Commission (AEC) from 1947-74, and the Energy Research and Development Administration from 1975 to 1977, were responsible for the design, manufacture, and testing of nuclear weapons. Production and testing activities occurred at fifteen major sites around the country as illustrated in Figure 1 (Chochran, et al. 1987). The weapons production activities undertaken by these agencies, and the private sector contractors who managed and operated the weapons production complex, were conducted within a framework of self-regulation which placed little emphasis on environmental protection matters (Grainey and Dunning 1995, U.S. Congress 1987 a, b, c). The Atomic Energy Acts of 1946 and 1954

gave the AEC powers to establish its own set of regulations for environmental, safety, and health matters. Because nuclear weapons were at the center of U.S. strategic policy during the Cold War, production was of paramount importance (DOE 1991, 1996). General Leslie Groves, chief of the Manhattan Project, best summed up the production imperative and foretold its resulting environmental legacy, “not until later would it be recognized that chances would have to be taken that in more normal times would be considered reckless in the extreme...while normally haste makes waste, in this case haste was essential” (Groves 1962, 2).

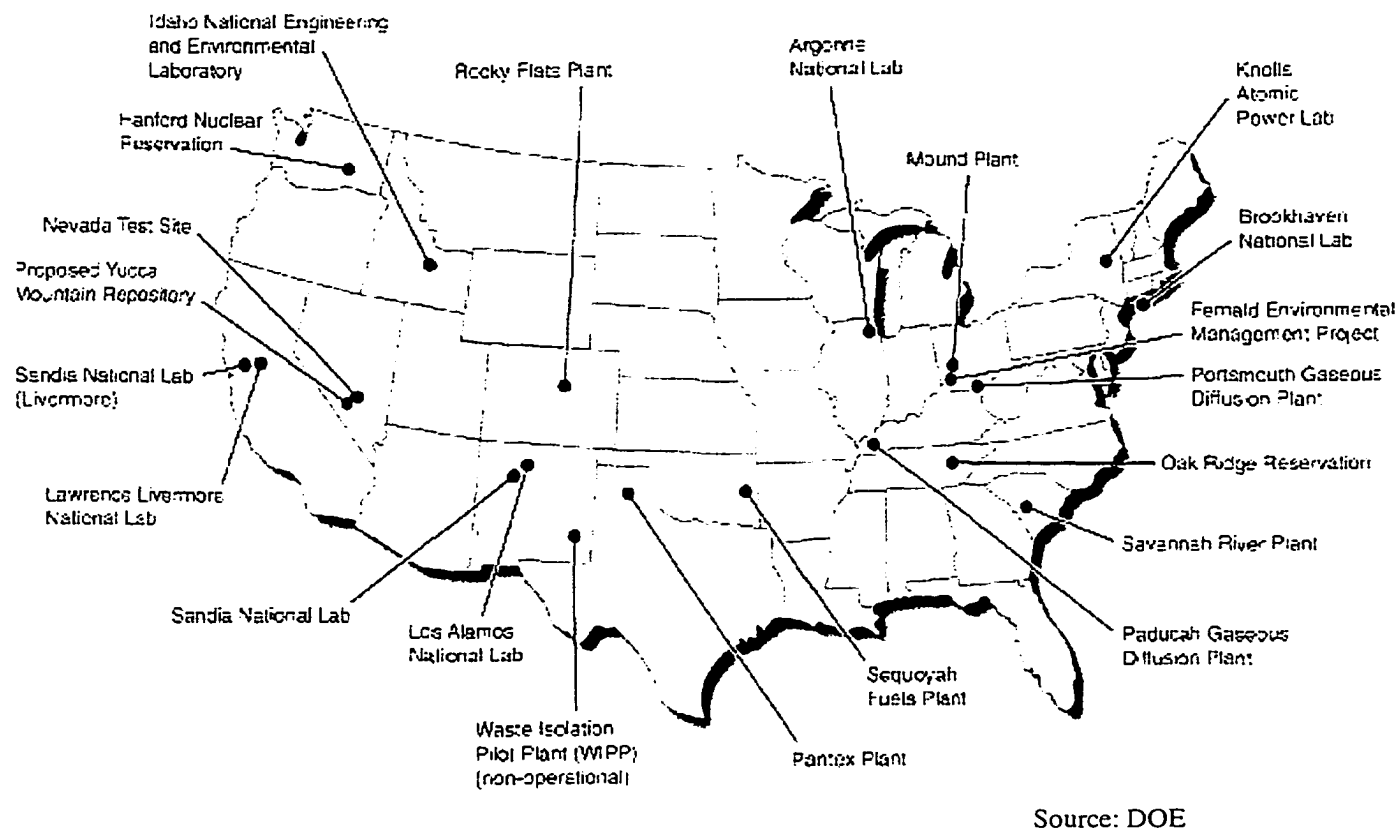


Figure 1.1: U.S. Nuclear Weapons Production Complex

Insulating the nuclear weapons policy process was a decision making structure restricted to a small group of political players, most of whom were allowed access because of technical and policy expertise. Therefore, weapons production decisions and activities occurred behind the scenes with little, if any, public scrutiny (U.S. Congress 1988 a, b). Moreover, because of the specialized technology, processes, and knowledge necessary for nuclear weapons production, the government relied heavily on a handful of private sector contractors to conduct the actual day-to-day work at the weapons facilities. The facilities were government owned and contractor operated (so-called GOCO facilities) and instituted a principal-agent relationship that allowed contractors to exercise substantial controls over operational information (Kettl 1993, U.S. Congress 1988a, 1993).

Coupled with the structural features of nuclear weapons policy was a set of ideas that acted to foster and maintain a favorable public image of weapons production activities. The Cold War ushered in a version of national security policy composed of such concepts as deterrence, massive retaliation, and mutually assured destruction. These concepts were founded upon a strategic force posture built around nuclear weapons. The centrality of nuclear weapons for U.S. national security policy, coupled with the intensity of the arms race with the Soviet Union, meant that secrecy provided a veil around weapons production activities and ensured a tight control on all production-related information (DOE 1996). In addition, patriotism and the “national interest” were key ideas that further insulated nuclear weapons policy from questions and criticism (Dycus 1996). Finally, nuclear weapons production represented an economic boon to

communities and districts where facilities were located, by providing high paying employment and a steady flow of revenue (Gerber 1992).

The secretive and restricted nature of nuclear weapons production policy, however, came with a high price. In a 1991 study of the nuclear weapons complex, the congressional Office of Technology Assessment (OTA) confirmed what secret government documents, speculation, and investigative reporting had hinted for years: in fashioning the tools of deterrence, nuclear weapons production activities had produced enormous environmental contamination and created threats to public health (See Table 1). The OTA report pulled no punches in its description of the environmental problems in the nuclear weapons complex:

“Contamination of soil, sediments, surface water, and ground water through the nuclear weapons complex is extensive. At every facility the groundwater is contaminated with radionuclides or hazardous chemicals. Most sites in non-arid locations have surface water contamination. Millions of cubic yards of radioactive and hazardous wastes have been buried through the complex, and there are few adequate records of burial site locations and contents. Contaminated soils and sediments of all categories are estimated to total billions of cubic meters” (OTA 1991, 4).

The environmental contamination problem at the weapons production complex developed over several decades and was the result of a number of interrelated factors. According to the OTA report, the environmental, safety and health problems at nuclear weapons facilities could be traced to,

“the nature of the manufacturing processes which are inherently waste producing; a long history of emphasizing the urgency of weapons production in the interest of national security, to the neglect of environmental considerations; a lack of knowledge about, or attention to, the consequences of environmental contamination; and an enterprise that has operated in secrecy for decades, without any independent oversight or meaningful public scrutiny” (OTA 1991, 4).

An additional factor leading to the environmental, safety and health problems was that military radioactive waste management and disposal issues had never been adequately addressed during the Cold War. Although identified as an important issue as early as 1948, the management and permanent disposal of radioactive waste had always been a peripheral issue in the weapons production process. For years, nuclear waste disposal was an issue to be addressed in “the future” and thus lagged behind the primary need of nuclear materials and weapons production. Furthermore, the treatment and storage of the weapons production waste byproducts amounted to rudimentary measures at best considering the longevity and toxicity of the materials. Radioactive materials were often poured directly onto the ground, into unlined pits, or injected into wells. Materials were also buried in storage containers that were inadequate for long term safety and reliability (OTA 1991). In addition to radioactive contamination, other hazardous materials, including mercury and volatile organic compounds are found throughout the nuclear weapons production complex (DOE 1991, 1996, Holt 1994).

Challenging the Nuclear Weapons Policy Monopoly

What had emerged by the early 1980s, was a nuclear weapons production policymaking structure that was restricted and limited in scope, and insulated from public involvement and scrutiny by the idea of national security and the practice of secrecy. Despite this seemingly impenetrable policy monopoly, it was not long after the emergence of “environmentalism” on the national political agenda that nuclear weapons production policy became a focus of policy reform efforts. At the forefront of the concern were questions about threats to the environmental and public health posed by

nuclear weapons production activities. A more general issue of concern was over federal agency compliance with environmental, safety and health (ES&H) regulations, particularly federal activities involving national security programs such as nuclear weapons production. Perhaps ironically, many of the questions, and some of the most energetic opposition, emerged from the communities surrounding the weapons production facilities. Investigative reporting, along with a growing number of scientific and health analyses suggested a long history of radioactive contamination and releases of hazardous materials, including plutonium, at nuclear weapons sites. Information also emerged which suggested that some toxic releases dating back to the late 1940s were deliberate, and that the AEC and DOE had made efforts to conceal the contamination problems in the complex. Adding a controversial element to the emerging information was the fact that the federal government had consistently reassured local residents and workers that operations at the weapons complex were safe and posed no threat to public health and the environment (Fehner and Holl 1995, Gerber 1992, Reicher and Sherr 1988, DOE 1993).

Another key development was that knowledge about health hazards of exposure to radioactivity had expanded by the mid-1970s. Studies of complex worker death rates, for example, suggested that exposure to radioactive hazards was much more dangerous than previously believed and accepted as tolerable during the 1950s and 1960s (DOE 1996). These studies were coupled with increasing controversial litigation concerning the negative health effects from weapons testing during the 1950s and 1960s. Moreover, conflict was growing about the effort to site a permanent facility for high-level nuclear waste. The Department of Energy had stumbled badly in the process of selecting a final burial site for military nuclear wastes and in so doing, created a public relations

nightmare (Jacob 1990). Finally, the Department of Energy's own apparent disregard for environmental protection measures at the weapons facility added fuel to a growing opposition and raised serious questions about the government's trustworthiness (Dycus 1996, DOE 1993). The result was that questions were being raised about how the federal government could possibly promote the national security interests of the country while at the same time endangering the people and territory it was supposed to defend. In short, the positive image that had sustained nuclear weapons production for decades had begun to crumble.

At the same time, the Department of Energy was increasingly unable to maintain its policy of self-regulation concerning environmental matters. Not only was the veil of secrecy gradually being lifted on the environmental legacy of nuclear weapons production, but key court decisions were handed down during the early 1980s which required the agency to abide by federal hazardous waste regulations (Reicher and Scherr 1988, Holt 1994). A variety of political institutions were also being gradually crafted which chipped away at the self-regulatory regime to allow for increased oversight of DOE by federal and state agencies. State and local governments meanwhile were demonstrating increasing concern over problems in the weapons complex, and were attempting to flex their political muscle in an effort to compel the DOE to abide by state environmental regulations. Growing state and local opposition to problems in the weapons production complex occurred within a larger trend of "new federalism" where authority for environmental program decision making was gradually being shifted from the federal to state governments (Davis and Lester 1989, Lester 1995). Perhaps unwittingly, federal efforts to empower state and local governments was rapidly

becoming a tool to extend state-based hazardous waste and toxic substance regimes over nuclear weapons production activities (Everest 1993).

By the mid-1980s, the DOE was moving slowly and grudgingly toward addressing its environmental problems. Some of this movement had been prompted by DOE's own initiative to deal with the growing controversy by establishing new organizational forms and launching a comprehensive analysis of its environmental problems (DOE 1989). The DOE was also opening up its formerly secret files about weapons complex operations. A chorus of voices were demanding more information and arguing that secrecy was being used not simply to shield nuclear information from the Soviet Union, but also to keep the public in the dark about the environmental legacy of the weapons production and testing process (Dycus 1996).

The growing public discontent with DOE environmental practices was heightened by the April 1986 disaster at the Chernobyl nuclear plant in the Ukraine. Because of design similarities between the Chernobyl plant and one of DOE's plutonium production reactors at the Hanford Reservation in Washington, attention was immediately focused on the possibilities of a similar accident in the U.S. While the possibilities of an accident were quickly dismissed by DOE officials, the accident nevertheless focused intense, high-level national attention on DOE nuclear production reactors specifically, and the operations of the weapons complex more generally. In the aftermath of Chernobyl, several expert panels were convened to examine DOE's operation and management of the weapons complex. The conclusions could not have been more devastating for the agency's image (National Research Council 1987, 1988, 1989, U.S. Congress 1987a). Suddenly, DOE's abysmal environmental, safety, and health record was prominent in the

national press. What had been a relatively placid effort to manage change in the weapons complex seemed to take on a life of its own as the controversy spread across a number of political institutions, and ushered in a period of rapid policy change. During congressional investigations into DOE activities in 1988, Senator John Glenn (D-OH) perhaps best articulated the emerging image of nuclear weapons production policy when he said, “It will do us precious little good to protect ourselves from the Soviets or any other potential aggressor if in the process we poison or substantially irradiate our own people” (U.S. Congress 1988a). Coupled with the end of the Cold War in 1991, and the subsequent reduction in the need for nuclear weapons, the DOE embarked on a new mission to comply with environmental regulations and clean up its 40-year legacy of weapons production.

By the early 1990s major policy changes had occurred in nuclear weapons policy which, only a decade earlier, had seemed inconceivable. Not only had the institutional structure of nuclear weapons policy been dismantled, the positive image that sustained weapons production activities since the Second World War had been shattered. In general, the policy change could be described as one in which the DOE, which heretofore had resisted policies associated with the broad notion of “environmentalism,” came to embrace environmental protection policy. In brief, these changes were: (1) efforts to comply with federal and state environmental regulations, and the cleanup of contaminated sites; (2) a change in the agency’s *primary mission from weapons production to facility cleanup*; (3) greater openness to public scrutiny including the release of previously classified materials about weapons production and testing activities; (4) openness in the policy planning and implementation processes, and inclusion of previously excluded

players including state and local governments, Indian tribes, and public interest organizations; (5) reorganization to include environmental management functions, and major budgetary and personnel commitments to the cleanup process; and (6) changes in DOE's relationships with its facility management and operations contractors. Considering the nature of weapons production policy just a decade earlier, the policy changes were profound. The political institutions and policy ideas that had created and sustained the nuclear weapons policy monopoly for 40 years had been transformed.

The story of how environmental, safety and health policy permeated the previously closed nuclear weapons production policy monopoly after nearly 40 years raises important theoretical questions about policy change and the dynamics which stimulated such dramatic and sudden change after years of stability. Explaining policy change is important not only for understanding the evolution of a particular policy, but also for understanding how and why the American policy process itself has undergone change. In other words, explaining policy change is as much a story of a specific policy as it is an illustration of the changes in the larger American public policy processes.

The purpose of this paper is to systematically examine the factors and dynamics that brought about such sudden and dramatic policy changes after decades of stability. Toward this end, this paper will cover the time period from the mid-1940s to the early 1990s. This longitudinal approach to policy change will allow for an examination of the development, maintenance, and decay of the nuclear weapons production policy monopoly.

Understanding Policy Change

Rapid change in public policy often occurs, but most theories of pluralism emphasize only incremental change (Baumgartner and Jones 1993, Lindbloom 1959, Wildavsky 1984). Despite the prevailing perception, an historical view illustrates that many policies, and the institutions responsible for policy making and implementation, are characterized by long periods of stability punctuated by short bursts of dramatic changes. In public policy making, an infusion of new ideas, mobilization of constituencies and expansion of political conflict, changes in institutional structures, and the self-reinforcing effects of these tendencies, combine to create sometimes dramatic and unpredictable changes in policy issue areas (Jones, Baumgartner and True 1998).

A number of longitudinal studies have illustrated how many previously stable public policy areas have been dramatically altered during recent political history. Bosso's (1987) study of pesticide policy, Campbell's (1988) analysis of the demise of the nuclear power industry, Derthick and Quirk's (1990) study of deregulation in the American economy, and Eisner's (1990) analysis of antitrust policy, all illustrate how a variety of public policies have undergone dramatic change after years of stability. These longitudinal analyses point to a number of complex interrelated factors which brought about profound change in previously stable decision making systems. The central question, it seems, is how to develop a systematic explanation of dynamic policy change after years of stability.

In addition to policy-specific studies, several efforts have emerged which offer systematic approaches for explaining the rise and demise of policy subsystems and dramatic changes in public policy. Baumgartner and Jones (1991, 1993) propose a

punctuated equilibrium model of policy change where the infusion of new ideas onto political agendas stimulate an interaction of policy image and venue, thus affecting the creation, maintenance, or destruction of policy monopolies. Ripley and Franklin (1991) contend that patterns of congressional-bureaucratic relationships, and the politics of favoring or opposing the status quo, shape the policy formulation process and ultimately affect policy stability and change over time. Sabatier and Jenkins-Smith (1993) explain policy change as a result of competition between advocacy coalitions, which utilize knowledge and the process of policy-oriented learning over time. Policy change can also result from changes in governing coalitions or the leadership of key agency personnel. Policy entrepreneurs can also play a significant role in changing public policy by devoting their personal resources into reform efforts (Kingdon 1984). In addition, focusing events or the emergence of a crisis atmosphere can stimulate or accelerate policy change (Baumgartner and Jones 1993, Kingdon 1984). Finally, a number of scholars propose that policy change is the result of political conflict initiated by reform proponents who attempt to expand the conflict over policy and increase the number of sympathetic participants in the decisional process (Schattschneider 1960, Thurber 1991). Although these analytical efforts approach the puzzle of policy change from a slightly different perspective, all contain useful elements for explaining the dynamics of policy change.

Explaining change, however, has not been relegated to examining the dimensions of specific public policies. Much of the policy change literature has also illustrated the changes that have occurred in the larger public policy process, particularly since the 1960s. Public policy studies began with the notion that policy was the result of the interaction of a limited number of political players operating in a consensual “iron

triangle” (Berry 1989a). During the 1970s and 1980s, scholars noted that policy was increasingly the product of “issue networks” (Heclo 1978) “policy subsystems” (McCool 1989) and “advocacy coalitions” (Sabatier 1987) where a wide variety of political players are involved in an increasingly open and conflictual policy process, and where interest groups act as sources of countervailing power for established interests (McFarland 1992). Changes in our conceptualization of the policy process have mirrored the expansion and influence of interest group politics (Lowi 1979, Berry 1989b), the increasing policy activity of state and local governments (Anton 1989), the media (Weart 1988) and non-governmental experts (Heclo 1978), greater policy involvement by federal courts (McSpadden 1995), along with the development of political institutions and structures which allowed for more avenues of citizen and group activity in the policy process (Ciglar and Loomis 1993).

Bosso (1987), best sums up systemic changes by illustrating what he terms the “fractionation and permeability” of the policy decisional structure. In other words, the public policy process is more open and accessible, more conflictual, and involves a wider variety of players and policy venues than it once did. Understanding the dynamics of this “fractionation and permeability” has shaped our conceptualization both of who makes public policy, and how the process of policy making unfolds. These developments have shaped our understanding of the dynamics of and changes in the political system that have occurred over the past few decades, along with the changes that have altered specific policy areas.

Plan of the Dissertation

The chapters in this paper will be organized as follows. Chapter two will present a review of the literature by organizing the material according to the most prominent features of the policy change literature. Chapter two will then present an overview of the punctuated equilibrium model and illustrate its major assumptions about policy change. Chapter three will present the research design of the paper and the hypotheses to be tested.

Because the time period covered in this study spans nearly fifty years, chapters four through six will focus on three distinct periods of time. Chapter four will cover the years from 1945 to 1970. This was the period characterized by the creation and maintenance of the nuclear weapons production policy monopoly. This time period spans the beginnings of nuclear weapons production of the Manhattan Project through to the dissolution of the Atomic Energy Commission. From the mid-1940s until the mid-1970s, nuclear weapons production policy was truly monopolistic with control of policy resting with the Atomic Energy Commission, the Joint Committee on Atomic Energy, and experts in the nuclear and defense fields. Moreover, the image of weapons production was positive and cloaked behind a veil of secrecy. In addition, opposition to nuclear weapons activities was mostly sporadic, loosely organized, and unable to effectively penetrate the closed policy making institutional structure.

Chapter five will cover the period 1970 to 1985. This chapter essentially covers the time period where policy changes began in an incremental and limited fashion. After contentious debate in the aftermath of the demise of the AEC, the Department of Energy was created in 1977. In addition, the Joint Committee on Atomic Energy was dissolved

in 1977, ushering in a process of jurisdictional fragmentation in Congress. The years 1970 to 1985 also witnessed a maturation of the opposition to nuclear weapons production policy, particularly at the grassroots level. In addition, several factors emerged to stimulate the process of policy change including key court decisions, actions by state governments, and changes initiated by the federal government in the administration of weapons production policy.

Chapter six will cover the years 1986 to 1994. This period of time witnessed an explosion of critical media and congressional attention to the weapons complex in the wake of the Chernobyl disaster and a rapid change in the nuclear weapons policy structure. In addition, interest groups, along with state and local governments, gradually emerged as key players in the weapons production policy monopoly due to the application of environmental, safety and health regulations to weapons production policy. New leadership at the DOE was also instrumental in spearheading policy change. Under the Bush administration, James Watkins' tenure as DOE secretary was characterized by vigorous efforts to adapt to new circumstances, and protect an agency under increasingly challenging attacks. Under the Clinton administration, DOE Secretary Hazel O'Leary initiated an "openness" policy wherein the veil of secrecy was lifted on all but the most sensitive weapons production matters. Moreover, with the end of the Cold War by 1992, the mission of the DOE shifted from weapons production to facility cleanup. By 1994, an entirely new institutional structure had replaced the formerly restricted and closed system that had once prevailed.

Chapters four through seven will utilize similar data and methods of analysis. To the extent possible, national and local media sources, congressional hearings and other

information produced by Congress, documents, and secondary sources will be used to examine policy image and venue during all three time periods. While the bulk of the data will cover the years 1970-1994, sufficient information from the years 1944-1970 is available to demonstrate the creation and maintenance of the nuclear weapons policy monopoly.

Chapter seven will present a discussion and analysis of the findings. This chapter will review the evidence in order to draw conclusions about the hypotheses and propositions posed in chapter two. These results will be followed by an analysis of the explanatory utility of the punctuated equilibrium model and suggestions for future research, and possible modifications to the model based on the findings of this study.

Chapter II: Policy Change, Review of the Literature and the Punctuated Equilibrium Model

Policy change has become an increasingly important area of political science inquiry in part because rapid change seems to defy pluralistic notions of the conservative, incremental nature of the American political process (Baumgartner and Jones 1991, 1993). Explaining policy change has also contributed to our understanding of the larger systemic changes in the American political system that play a critical role in the process of policy change. The scholarly record, particularly a growing body of longitudinal analysis, indicates a political system which displays remarkable stability in the way issues are processed, but which is also punctuated with periods of profound change. The following sections provide an overview of some of the central elements of policy change around which the literature is organized. Finally, the chapter presents an overview of the model of policy change used in this paper, the punctuated equilibrium model.

Agenda Setting

A number of scholars have argued that agenda-setting politics is the central arena in which political and policy change and stability is played out (Baumgartner and Jones 1993, 1991, Kingdon 1984). Nelson (1984) defines agenda setting as the process whereby public officials become aware of public problems, decide to give them attention, and mobilize their organizations to respond to them. How issues and ideas reach the agenda, and are manipulated once there, is critical for policy change because such

dynamics ultimately have consequences that can directly affect policy stability and change. Baumgartner and Jones (1993) argue that the policy consequences that flow from agenda setting are shaped by the emergence of new institutional arrangements. According to Kingdon (1984) the agenda setting process consists of three streams: problem recognition, policy proposals and alternatives, and political events. The confluence of these three processes can have important impacts on the shape of public policy outputs.

In focusing on agenda-setting, it is important also to recognize that while it may be attractive to conceptualize the governmental agenda as being a singular entity, it is more realistic to observe many agendas operating simultaneously across the American system (Baumgartner and Jones 1993, Rochefort and Cobb 1994). Multiple agendas are a natural outcome of the diffusion of political power in the American political system, whether this is within the federal level and/or between the federal and state levels. Kingdon's analysis of agenda setting illustrates that legislatures, courts, and public agencies at both federal and state levels of government all have policy agendas (1984). Even within a single institution such as the federal judiciary, we may be able to talk about the court's "agenda," but would also have to acknowledge that the cases on the court's docket span a huge variety of issue areas. Similarly, the congressional agenda will inevitably contain a number of policy issues being considered simultaneously within the fractured committee system. Deering and Smith (1997), for example, argue that in very rare exceptions is it possible to identify a single congressional agenda because individual committees have policy agendas of their own given the nature of their varied policy jurisdictions. In short,

the literature indicates the importance of focusing on the dynamics of multiple, interacting agendas, and how those processes stimulate policy change.

Political Conflict

One of the time-honored explanations of policy change is the occurrence of conflict. Political conflict in this sense encompasses the development and articulation of policy reform ideas, as well as the mechanisms through which political conflict expands, and the agents acting to expand conflict. Schattschneider (1960) placed conflict at the center of the policy change process and argued that proponents of policy reform have an incentive to expand conflict in order to change the roster of participants in the policy process. As conflict widens, according to Schattschneider, the mobilization of bias in favor of the status quo can be altered, thereby increasing the chance of changing public policy.

Ripley and Franklin (1991) also focused on the dynamic of conflict and argued that political conflict can be stimulated by (1) aggressive inquiry by high government officials into the functions of a policy subsystem; (2) the introduction of new issues into the subsystem, and (3) disagreement originating within a policy subsystem. In other words, political conflict can emerge from varied sources particularly under conditions where prevailing policies are under criticism from reform-oriented actors.

A conflict-based explanation of policy change is closely linked with agenda dynamics. Political conflict can be a decisive for placing new ideas and information on political agendas, which may challenge the established ideas underlying prevailing public policies. The consequences that flow from new ideas coming onto political agendas are

critical to altering the institutional structures central to the policy process. As Peters and Hogwood (1985) maintain in their critique of Downs' "issue-attention cycle" argument (1972), the idea of "environmentalism" was not a passing fancy because institutions were created and maintained which solidified the idea of environmentalism in organizational structures and policy procedures. Nor were environmental groups merely a flash in the pan. Bosso's notion of "presence politics" (1987) is based on the finding that environmental groups took advantage of institutions created by laws and statutes which ensured avenues of participation in the political process to continue operation and seek out new policy areas to effect change.

A key dynamic of political conflict is how reform proponents expand conflict in order to change the roster of participants and alter the mobilization of bias in ways favorable to policy change. Conflict expansion can occur in the classic loser appeal strategy identified by Schattschneider (1960) where policy reform proponents can appeal to the previously uninvolved. For Schattschneider, along with Cobb and Elder (1983), this appeal is focused on the mass public under the assumption that once the balance of opinion shifts toward reform ideas, political authorities will alter public policy accordingly. Given the many political venues that exist in the current American system, as well as the available avenues of access, however, many of which did not exist in Schattschneider's day, proponents of policy change can conduct a strategy of conflict expansion by attempting to include more participants by seeking out political venues which might be more receptive to their policy reform ideas (Baumgartner and Jones 1993). This strategy has been referred to as venue shopping.

Venue Shopping

In their analysis of policy change, Baumgartner and Jones (1993) provide evidence that in many cases of policy change, mass mobilizations and public opinion reaction occur late in the policy development process, after many of the most important issues have been decided by top-level policy makers, and through jurisdictional competition. In other words, the efforts of reform-minded proponents, and the direction of their conflict expansion, is most likely to be focused where the key policy battles are fought: other political institutions. The effort to expand conflict to other political institutions is referred to as “venue shopping” where policy reformers seek out receptive political venues for favorable responses to their ideas and policy proposals.

The diffusion of decision-making authority in the American system provides numerous policy venues wherein various actors can affect public policy (Berry 1989; Ciglar and Loomis 1993). Strategically minded reform proponents understand that being closed out of a particular policy subsystem, or finding certain institutional venues unreceptive to policy change, does not mean the debate is dead. Rather, reform proponents shift the policy conflict to other decision-making venues seeking a more receptive audience, and favorable action. The case of environmental organizations using the federal courts to compel government agencies to consider potential environmental impacts of major activities or projects is a classical example of venue shopping. Although proponents of environmental protection policy may not gain favorable action by a particular administrative agency, they can shift the political conflict to the federal court system in hopes of receiving a favorable ruling. A host of federal environmental policies, NEPA and Superfund for example, are essentially institutions that create venue shopping opportunities for environmental

organizations because they provide greater access to courts for organizations dissatisfied with agency environmental impact assessment processes (Ingram, Colnic, and Mann 1995).

Central to the venue shopping effort is the policy idea presented by reform proponents. Reformers seek to articulate the negative elements of a policy as a way of convincing policy makers of the need for change. If reform proponents can present a convincing image of policy to a particular venue, by utilizing symbols, rhetoric, and policy analysis, they may be able to gain attention and favorable action, and further the policy change process. Moreover, if reform proponents can establish or link up with allies in key venues, congressional committees for example, the venue shopping process can be facilitated. Success in presenting a particular policy image may lead to success in other venues as a positive feedback process develops and spreads to other political institutions which become receptive to the emerging policy idea (Baumgartner and Jones 1993).

Problem Definition and Policy Image

Central to understanding political conflict, strategies of conflict expansion and the interaction between ideas and institutions, is the concept of issue definition. How problems, conditions, and events in society are defined, and how subsequent proposals for solutions to problems are advanced, is central to the manipulation of images for attributing cause, blame, responsibility, and government response to issues (Kingdon 1984, Stone 1989).

One of the best explanations of the importance of problem definition is offered by Stone (1989) who deftly ties problem definition to agenda dynamics through what she refers to as the development of “causal stories.” Much like Kingdon’s (1984) emphasis on the importance of the interpretation of conditions as problems in society, Stone suggests that

causal stories are important determinants in political conflict and agenda setting dynamics. Stone focuses on the ability of political actors to portray issues in ways that suit their interests and argues that politics essentially involves strategic efforts to manipulate policy images. The development of issues, according to Stone, is a result of conflict over problems and policy definitions. Problem definition then essentially serves as a vehicle for policy reform proponents to gain political power. Stone implies that causal stories act to define public issues that are the result of purposeful human action, therefore providing the most persuasive story for agenda setting particularly when willful action is accompanied by an effort to conceal problems.

According to Stone (1989), it is the strategic portrayal of problems that can be decisive for facilitating policy change. Policy reform proponents articulate a causal story that connects the problem with the causal agent with the potential solution. The appropriate strategy for policy reform proponents is to create a causal story with culpable parties and to suggest possible policy responses by government to deal with the issue involved. For example, developing a causal story of a public health problem associated with an environmental issue can be a particularly effective tool for agenda setting (Bosso 1987). Among the political functions of causal stories, according to Stone (1989), are to challenge or protect an existing order, assign responsibility and blame, or create new alliances among alleged victims of the causal agent's actions or other real or potentially interested parties.

As new issue definitions emerge, and are accepted and acted upon by key political actors and institutions, a positive feedback process develops wherein small perturbations can cascade into major effects as they work their way through the political system. It is the classic notion of the "bandwagon effect" where ideas are diffused across the political

system and increasingly accepted by a number of different political institutions which then act to alter policy (Baumgartner and Jones 1993). Proponents of work, family, and gender issues, for example, were able to define those issues in ways that were ultimately critical in the development of public policy. Through successful argumentation, including the use of symbols and rhetoric, proponents of work, family, and gender issues were able to elevate these concerns to key venues in the federal government. In addition, successful argumentation established powerful allies in policy venues and convinced key political actors that government ought to play a more vigorous role in work, gender and family policy issue areas (Bernstein, Bricher and Einwohler 1995).

Learning and Policy Change

Another key element of the policy change literature focuses on learning-based approaches. Various approaches to incorporating learning as an explanatory variable have been developed in the policy literature. Heclo (1974) discussed learning in terms of the reaction of policy makers to changes in the political environment. Sabatier and his colleagues (1988, 1993) advocate a policy-oriented learning approach where changes in the belief structures of policy elites are eventually translated into public policy change. Rose (1993) equates learning with lesson-drawing in which policies are emulated across space and time. Hall (1993) suggests that learning results from policy analysis and evaluation where findings are incorporated into new policy instruments and approaches. At its greatest impact, according to Hall (1993), learning can bring about a policy paradigm change wherein the fundamental assumptions about a particular policy are altered resulting in changes in policy goals. Ethridge (1983) defines learning in terms of increased intelligence by and effectiveness of policy makers. Bennett and Howlett (1992) suggest that both

government and society can learn based on the emergence of information, which creates anomalies that erode prevailing understandings of policy.

One of the more interesting public policy models has been proposed by Sabatier and Jenkins-Smith (1993) who articulated an advocacy coalition approach to explaining policy change, which places learning as the central dynamic in the policy change process. The advocacy coalition approach places a particular interest on policy-oriented learning, and how it affects core and peripheral beliefs of policy elites about the means and ends of public policy. Through the accumulation of policy knowledge, advocacy coalitions composed of people from government and private organizations develop strategies to alter public policy. Perhaps more to the point, policy-oriented knowledge plays a key role in altering the normative and causal belief systems of the various actors within advocacy coalitions.

Several important studies identify that learning is at work in specific examples of policy change. Bosso (1987), for example, contended that one of the reasons for pesticide policy change was the gradual accumulation of knowledge concerning the environmental and health effects of organochemicals used in pesticides. As evidence of the negative effects of pesticide use was garnered over the years, it acted to challenge the idea that pesticides presented little threat to human health or the environment. Singer (1990) examined economic policy making in the Western industrial democracies and concluded that policy innovation and change is the result of fluctuations of belief systems within a policy subsystem. Changes in the dominant ideas concerning a particular policy, brought about by the utilization of new knowledge, help constitute economic policy change according to Singer.

While the literature clearly indicates some type or degree of learning at work in the process of policy change, it also indicates the conceptual difficulties of learning and, perhaps most importantly, its measurement (Bennett and Howlett 1992, Ethridge and Short 1983, May 1993). There is also a potential problem also in determining what has been learned (Bennett and Howlett 1992). This is especially true in technically complex issue areas where policy or scientific analysis may yield few unequivocal conclusions or where rival groups produce different conclusions. Wildavsky (1996) analyzed a number of cases in environmental policy where policy changed despite an absence of clear-cut evidence and proof of a causal connection between certain chemicals and cancer. Wildavsky's analysis of the Alar scare illustrates that learning may have very little to do with policy change particularly in cases where public perceptions, driven by media and policy entrepreneur speculation and manipulation of images, proved to be critical for policy change. Similarly, Weart (1988) concluded that changes in nuclear power policy were driven not by definitive knowledge of the risks associated with specific nuclear reactor designs, but with an emerging image that equated nuclear power reactors with potentially catastrophic consequences resulting from an accident. In these cases, policy reform proponents seized on opportunities to create new policy images, not by necessarily utilizing technical facts and knowledge, but by using rhetoric and symbols to criticize nuclear power policy and gain allies. In fact, the manipulation of policy images can often serve as a strategy to circumvent "the facts," particularly where facts and knowledge may present hurdles for policy change efforts, or present threats to the established policy arrangements. Similarly, members of existing policy subsystems may manipulate images to deflect conflict or criticism, maintain their control of the decision making process and keep items off political agendas (Edelman

1964, 1989). In short, whether a new idea, perception or policy image is based on scientific analysis and learning processes, might be less relevant than the fact that perceptions and images about a policy are being created, maintained, or changed through the use of analysis, rhetoric and symbols.

The challenges inherent in learning-based approaches certainly do not discount learning as an important factor in the process of policy change, but suggest an approach that incorporates learning albeit from a different perspective. May (1993) provides a useful approach for incorporating learning into explanations of policy change by differentiating between instrumental and social learning. Instrumental learning involves drawing lessons about the viability of policy instruments or implementation designs. Social learning, on the other hand, concerns the reconstruction of policy problems, the scope of policy, and/or policy goals, based on both new information and analysis and efforts to manipulate images and definitions for the purpose of constructing alternative explanations and proposals (see also: Kingdon 1984, Stone 1989). In this context, social learning implies that some degree of conflict has occurred wherein new definitions or interpretations of problems and issues are developed and ideas for solutions are advanced. New policy ideas and definitions may indeed be the product of instrumental and social learning, but the ultimate result is that the prevailing ideas and understandings that support a particular policy are challenged and undergo change.

Policy Entrepreneurs

In examining the role of ideas, and the dynamic of conflict expansion, the activity of policy entrepreneurs becomes important for explaining policy change (Dodd and Schott 1982, Kingdon 1984; Polsby 1984). A policy entrepreneur is an individual who essentially

gives voice to an alternative policy idea and attempts to sell the idea in the appropriate political institutions. Policy entrepreneurs can be key agents of change because they become involved in the process of calling attention to and defining problems, suggesting policy solutions, selling policy ideas to other political actors, building coalitions of supporters, and using various resources such as position or the media. In addition, policy entrepreneurs can expand political conflict by manipulating the policy image in ways that both attract additional participants and shift the debate to other political institutions where policy reform may be more amenable. Moreover, policy entrepreneurs may be able to determining when policy will change by seeking an opportune moment and also playing as key role in the particular policy changes which may result.

The diffusion of political power across the American system creates opportunities for policy entrepreneurship. Within Congress, for example, changes in the congressional committee structure allow for more entrepreneurial opportunities than existed before the congressional reforms of the mid-1970s (Dodd and Schott 1982). Loomis (1988) argues that a new generation of policy entrepreneurs has come to dominate Congress, in part, simply because opportunities for entrepreneurship exist and have important payoffs in terms of prestige. Moreover, the decentralization and institutional pluralism of Congress has aided policy entrepreneurship by providing individuals, who otherwise might not be involved, an opportunity to shape agenda setting and policy formulation processes (Kingdon 1984). Including the policy entrepreneur concept in policy change studies represents a means whereby the motivation and action of specific individuals remains an important factor in models of policy change.

Focusing Event/Crisis Atmosphere

The literature also indicates that a focusing event, or crisis atmosphere, can play a key role in stimulating or accelerating the process of policy change (Hogwood 1987, Kingdon 1984, Thurber 1991). According to Birkland (1997), the ability of a focusing event to impact the media, the political agenda, and public policy is dependent upon a number of complex factors including the nature of the event and perceptions about its cause and implications, coupled with the characteristics of the policy domain that deals with the issue. Thurber (1991) determined that a disruptive event can expand the interest, conflict, or number of participants in an issue area and lead to the temporary or permanent disintegration of policy subsystems. Perhaps the most important result of a crisis or focusing event is that it can raise the level of attention concerning a particular policy or issue. The media or government may focus attention on the event and its potentially larger meaning, or how the event illustrates a larger problem and indicates a need for government action to address the issue (Kingdon 1984). A focusing event or crisis atmosphere can also give policy reform proponents the opportunity to call attention to a problem and promote specific policy solutions. In this respect, Stone (1989) would argue that a focusing event would provide policy reform proponents the opportunity to articulate a causal story that ties together the event and its cause, along with the appropriate reform solutions.

Baumgartner and Jones (1991, 1993) appear to downplay the importance of a single focusing event for stimulating policy change. Their analysis of the demise of the nuclear power policy subsystem illustrates that the seeds of subsystem decay had been sown long before the 1979 accident at Three Mile Island (TMI). The TMI accident did play a role in solidifying public opinion regarding the attractiveness of nuclear power, but in and of itself,

did not play a decisive role in policy change according to Baumgartner and Jones. Other studies of the demise of nuclear power seem to confirm this conclusion although other studies identify events, which, while not necessarily focusing events, nevertheless played some part in policy change (Campbell 1988, Duffy 1997, Rankin, Nealey and Melber 1984).

While a single event may not itself stimulate policy change, a number of policy history studies reveal that a crisis atmosphere can develop over an extended period of time which gradually primes the opportunity for policy change. Smith's (1989) study of agricultural policy change in Britain, for example, found that policy changed, in part, because of the effect of a long-term crisis in the agricultural sector of the economy. Specific focusing events were not critical for agricultural policy change according to Smith. Rather, over a period of years, the sectoral crisis gradually eroded the previously solid support for agriculture policy, and created opportunities for policy reform proponents to argue for new policy solutions. Similarly, Bosso's (1987) study of pesticide policy change reveals few dramatic focusing events. Nevertheless, an atmosphere did emerge over time that fostered public doubt about the assumptions of pesticide safety.

Endogenous & Exogenous Sources of Policy Change

Tracing the development of policy change also reveals that factors both endogenous (internal) and exogenous (external) to a policy community are involved in policy change. In short, agents of policy change (individuals, organizations, and institutions) can be found in a variety of locations in the American political system. Change might originate within a policy community, through the intervention of political institutions outside a policy community, or through some combination thereof.

Acknowledging the role of endogenous and exogenous forces of policy change is also a means of illustrating the close connection between the dynamics of change in a specific policy, and systemic changes in larger public policy process.

Baumgartner and Jones (1993) argued that the intervention of macropolitical institutions (e.g., the judiciary, the presidency) is decisive for policy change. Knott and Hammond (1992) also alerted us to the fact that political institutions outside the structural framework of a policy monopoly can play a decisive role in initiating policy change. Their study of regulatory policy found that the forces of change could not be explained simply by either changes in the climate of public opinion, or in large-scale economic changes, although these were clearly important factors. A more fulsome explanation includes the role of macropolitical institutions in the policy process, in this case the president and the courts, and how they played a critical role in initiating regulatory policy change. In fact, the authors determine that in every case of deregulation, forces outside of Congress initiated key policy changes.

Sabatier and Jenkins-Smith (1993) also argued that institutions external to a policy subsystem can stimulate policy change. For example, changes in socioeconomic conditions and technology, changes in governing coalitions, and policy decisions and impacts from other subsystems can have a substantial policy impact. Studies of nuclear power policy change illustrate how exogenous economic factors played a role in the demise of the industry (Campbell 1988, Baumgartner and Jones 1993). In addition, efforts by state governments to play a more prominent role in the nuclear power licensing process were important in halting the development of the industry. California's 1976 Nuclear Safeguards Initiative, for example, created a series of hurdles for the nuclear

industry which essentially blocked the construction of partially completed plants and promised to drive up the costs of proposed facilities (Duffy 1997).

Ripley and Franklin (1991) argued that political conflict may emerge from within a policy subsystem and stimulate the process of change. For example, conflict endogenous to a subsystem may be initiated by newly appointed agency personnel, by changes in internal policy, or by conflict arising from competing factions within a subsystem. Campbell (1988) and Ford (1982), for example, determined that the political conflict which led to the demise of nuclear power ostensibly began within the Atomic Energy Commission over reactor safety issues. What began as an internal legitimacy crisis quickly expanded outward to the larger scientific community and the public as AEC scientists and safety experts began publicly questioning reactor safety policy. Questions about reactor safety raised by nuclear scientists gained a great deal of attention from the press, Congress, and organized interests who argued that the AEC could not simultaneously promote and regulate nuclear power. This argument eventually led to the termination of the AEC and its promotional and regulatory functions being divided among separate agencies. In short, because the legitimacy of the nuclear power subsystem had been maintained, in part, by scientific expertise, the legitimacy and image of the policy suffered when experts began to disagree on safety policy. Bosso (1987) also determined that that a key factor in pesticide policy change occurred when dissent within the larger scientific community revealed that many experts disagreed with the prevailing understanding that pesticides posed an insignificant threat to public health and the environment. In short, the dynamics of conflict endogenous to a policy subsystem can be critical in stimulating policy change,

particularly if such conflict expands beyond the boundaries of the subsystem and received focused attention from the media, Congress, or other important political institutions.

Longitudinal Analysis

A final theme found in the policy change literature is the general argument that a proper analysis can be produced through longitudinal analysis, or following the development of a policy over an extended period of time. While this may be more a methodological issue, studies tracing an issue over time often reveal that the same issue has emerged or receded from political agendas often with little change in its substantive content (Baumgartner and Jones 1993). Kingdon's question, "how does an idea's time come?" is essentially an argument for a study period which spans a potentially large time period in order to understand agenda dynamics and the rise and decline of issues. A longitudinal approach focuses on time spans of a decade or more where the influence of policy analysis and learning can alter the perceptions and conceptual understandings of political actors. Moreover, studying policy change over a decade or more can reveal policy changes resulting from developments in macroscale trends such as socioeconomics, public opinion, changes in governing coalitions (Sabatier and Jenkins-Smith 1993). In studying policy change, the longitudinal approach is preferred over the cross-sectional approach because the latter provides only a snapshot of policy at a particular point in time. Such a snapshot often fails to paint the portrait of how a policy changes over time and the factors involved in that process (Baumgartner and Jones 1993).

Explaining Policy Change: The Punctuated Equilibrium Model

This section presents a discussion of the model of policy change used in this paper and the hypotheses to be tested. This paper will use a "punctuated equilibrium model" of

policy change as proposed by Baumgartner and Jones (1991, 1993). By examining the interaction between policy image (how a policy is understood and discussed), and policy venue (decision making institutions), the model accounts for both long periods of policy stability interrupted by periods of rapid policy change. Following a description of the punctuated equilibrium model, the research design for this project will then be presented.

One potentially fruitful approach for explaining policy change, and illustrating the larger changes in the American public policy process, is offered by Baumgartner and Jones (1993) who term their approach the “punctuated equilibrium” model. The authors borrow the term from the field of evolutionary biology where the model was purported to explain both long periods of stability interrupted by short, intense bursts of change (Gould 1989). Perhaps the first use of the concept of punctuated equilibrium to explain political dynamics was developed by Stimson and Carmines (1986) who examined the evolution of racial desegregation policy of the late 1950s to the mid-1960s. They used the idea of “punctuation” to illustrate how issue changes initiate larger changes in political party alignments. At a particular point in time, what Stimson and Carmines term the “critical moment,” the political system moves from a steady state to one characterized by dramatic and rapid change. A dynamic process underlies this change which allows for gradual change, but also allows for sudden and dramatic change (Stimson and Carmines 1993).

The attractiveness of the punctuated equilibrium model is that it explains both policy stability and change. Baumgartner and Jones argue that a single process can explain both periods of policy stability and short bursts of rapid policy change. This process is the interaction of the policy image, the beliefs and values concerning a

particular policy, and the policy venue, the institutions with policy and decision making authority. What distinguishes the approach offered by Baumgartner and Jones is their focus on policy image as playing a key role in policy stability and change. The authors place a heavy emphasis on ideas and image in explaining policy change and stability, particularly in how the infusion of new ideas onto the political agenda, or changes in the prevailing image of a policy, coupled with an expansion of attention to a policy can bring about rapid policy change. Policy change can occur if the escalation of the political rhetoric is combined with an ongoing search for the most favorable institutional venue for policy decision making. In brief, policy reform advocates can bring about change by (1) focusing on or publicizing the negative aspects of existing policies through the use of rhetoric, symbols, or policy analysis, (2) seeking institutional venues susceptible to a changing policy image, which contributes to (3) venue expansion and image change, and (4) shifts in policy direction through the development of new institutional structures.

Policy Monopolies: Image and Venue

Baumgartner and Jones are interested in systematically explaining the processes that lead to the creation, maintenance, and decay of policy monopolies over a lengthy period of time. A policy monopoly exists when there is a monopoly on the control of institutions that make policy decisions, as well as a monopoly on the idea dimensions that characterize an issue. Thus, there are two related elements of a policy monopoly: policy venue and policy image. First, there is a definable institutional structure responsible for policymaking, the policy venue. American public policy has been described as the sum of many actors in numerous decision making systems organized around discrete programs (Thurber 1991). These decision making structures have been variously described over the

years as evolving from rigid “iron triangles” to more open and fluid “issue networks” and “advocacy coalitions” (Sabatier 1988, Sabatier and Jenkins-Smith 1993). The structural dimension of the “iron triangle,” for example, was composed of a congressional committee with policy jurisdiction, a federal agency responsible for policy implementation, and an organized interest that received benefits through the policy. According to Baumgartner and Jones (1993), policy venues may be monopolistic or shared. In other words, a policy may be subject to the jurisdiction of several institutions simultaneously, or it may fall within the domain of only one set of institutions.

The second characteristic of a policy monopoly is a powerful supporting idea associated with the institutional structure: the policy image. The policy image may be a set of ideas as broad as economic growth and prosperity, and national security, or as specific as veteran’s preferences in federal hiring procedures. What makes the idea dimension so important for policy stability and change is how the policy idea is defined and communicated. It is the emphasis on ideas and image that differentiates the policy monopoly from the traditional iron triangle or subgovernment conceptualization. The latter have been useful for conceptualizing the structural arrangements and components of policymaking, but have generally neglected to examine the centrality of ideas in the policy process, especially the role played by ideas in policy stability and change. Policy ideas that enjoy widespread support essentially provide legitimization of the policy itself as well as the overarching policy decision making structure (Baumgartner and Jones 1993).

Creation and Maintenance of Policy Monopolies

Our understanding of the dynamics of creation, maintenance, and decay of policy monopolies ultimately comes about through the interaction of policy venue and policy image. Baumgartner and Jones state that policy monopolies are usually created under conditions of enthusiasm (1993). In other words, policy subsystems can be created during periods when public understandings of the questions involved are overwhelmingly positive, or when criticism is absent. Because of the favorable policy image, institutional structures are created which establish a particular policy making arrangement. Baumgartner and Jones essentially borrow the notion about the “mobilization of enthusiasm” from Downs (1972) who argued that enthusiasm over an issue generates a momentum that leads to the development of policy and the establishment of policy subsystems.

The stability of a policy monopoly can be maintained over time by the interrelationship of two major elements: the existing structure of political institutions and the definition of the issues processed by those institutions. The structure of a policy monopoly contributes to policy stability over time because it effectively excludes outsiders from the decision making process. The question of “who participates” in policy decision making is ultimately determined by the formal and informal rules of access associated with a particular institutional structure (Baumgartner and Jones 1993). National security policy, for example, has traditionally been the policy province of select officials and organizations of the federal government. Moreover, the nature of military policy engenders a closed structure of decision making where secrecy is often of the most stringent nature.

Exclusion may also result from the technical nature of a policy. Issues requiring technical expertise, such as national security issues, can engender very limited rules of access, which are exceedingly difficult to breach. Access to decision making structures might also be blocked because of the jurisdictional boundaries of a policy. For example, jurisdictional boundaries found in the congressional committee system, and in the administrative apparatus, can limit access to policy decision making structures. Moreover, stability may be maintained by the arcane nature of a policy that does not attract significant attention, even from potential opponents. Supporters of such niche policies, agricultural commodity supports for example, maintain control by keeping the policy out of the limelight. Such policies are often narrow in the scope of both the issue, as well as the institutions responsible for decision making (Brown 1988).

Finally, from the perspective of the American political process, access to decision making structures might be limited simply because laws and statutes might not provide access even for interested parties. As mentioned above, this is less of an exclusionary force than it once was. The participatory revolution of the 1960s and 1970s was stimulated in large measure because a number of laws were passed which provided various avenues for participation by interested groups and individuals. Along with more liberal rules of standing in the federal judiciary, many of the policies which were once the domain of a narrow set of political actors working within restricted decision making structures.

The mere existence of an institutional structure by itself does not adequately explain policy stability over time. Also important is the idea that supports the institutional structure and provides legitimacy for both the structure and the policy.

Stability of a policy idea over time is due to either the positive nature of the idea, the fact that key political actors accept the idea or are at least unopposed to it, or some combination therein. Those involved in the decision making institution attempt to maintain the acceptable image of the idea. This may be done through symbolic politics coupled with the development of rhetoric that communicates a positive image of a policy and therefore promotes stability (Edelman 1964, 1989).

Image contributes to policy stability over time also because it helps legitimize the institutional structure responsible for decision making. A policy idea that is sold as positive contributes to the maintenance of a policy monopoly. As long as the policy image remains positive, where participants in the institutional structure can deflect criticism through the communication of values and rhetoric, the policy itself will remain stable. This is particularly true in technically complex areas where specialized expertise is often essential for policy decision making, or articulated as such, in the decisional process. If the policy area is one in which technical expertise is necessary, the response to reformist attacks may take the form that policy reformers are unqualified and lack the necessary policy expertise. Indeed, a key component of the policy image is that “the experts know best” and are making decisions in the best interest of the nation, and therefore are entitled to privileged decision making roles. Reformist ideas can also be blunted if the existing policy idea is defined as critical to the well being of the nation, and that policy reform essentially represent a threat to the existing order. This seems particularly true for national defense policies where, for example, arms control proponents were often labeled as “peaceniks,” whose shortsighted views were not in the best interest of the nation.

The stability of a policy monopoly can also be maintained over time simply because there is little attention paid to the particular policy. Media attention may be sporadic or nonexistent because the policy lacks controversy. Once established, the participants in policy monopolies tend to keep their issues out of the spotlight and avoid the possible consequences that popular attention might bring. Similarly, the nature of the policy may not prompt interest groups to mobilize in opposition to the policy. The media, members of Congress, or organized interests, for example, rarely criticize policies that provide benefits to veterans. This lack of criticism promotes policy stability because there are few individuals or groups who would call for reform of veterans' benefits even if reform might achieve some greater good, such as reducing budgetary expenditures. In short, the popularity of the idea that veterans because of their sacrifice to the nation are entitled to a wide range of programs and benefits, promotes policy stability.

Decay of Policy Monopolies

The dynamic associated with the decay of policy monopolies is almost always associated with a change in intensity and tone of interest in a policy. Representatives, groups, government agencies, the media, etc, become involved in an issue primarily because a new understanding of an issue emerges. Policy reform proponents claim that a particular policy is unfair, harmful, wasteful, etc, and attempt to fashion a new policy image, one which calls into question prevailing images. In other words, the combination of increased negative attention, and an expansion of political conflict, is a crucial dynamic for dismantling a policy monopoly. The connection between issue attention and conflict expansion was first identified by Schattschneider (1960) who termed the phenomenon the mobilization of criticism.

The punctuated equilibrium model treats reform-oriented political actors as capable of action by employing a dual strategy which combines policy image and venue: 1) reformers attempt to manipulate the prevailing image of a policy through the use of rhetoric, symbols, and policy analysis; and, 2) they try to alter the roster of participants who are involved in the issue by seeking out the most favorable venue for the consideration of their issues. Central to the interaction between image and venue is conflict expansion. Any time political actors can successfully introduce new dimensions of political conflict into an issue area, policy monopolies can be destabilized (Baumgartner and Jones 1993). Conversely, members of a policy subsystem will also use rhetoric, symbols, and policy analysis in an effort to maintain a favorable policy image, one that casts the policy and its institutional arrangements in a more favorable light. In addition, policy subsystem members will attempt to limit the roster of participants involved in the issue by claiming that outside forces lack legitimacy, authority, or expertise. In short, political conflict is often manifest where opposing forces are involved in a contest over policy image. The extent to which conflict expands or is contained is therefore critical for policy stability and change.

Conflict expansion serves as the key link in the interaction between policy image and policy venue. Like a number of other scholars, Baumgartner and Jones seek to expand Schattschneider's (1960) notion of conflict expansion as being central to policy change. Losers in a policy conflict may be shut out of the decision making process, dissatisfied with government action or inaction, opposition to a particular policy, or lack resources to continue the fight. Yet they may have both the opportunity and the motivation to expand the political conflict to other more receptive institutional venues.

These venues might include the courts, congressional committees, the president or his staff, other public agencies, state and local governments, the media, policy experts, and possibly the general public. The process of venue shopping, or seeking out a political venue receptive to policy reform ideas, is carried out through the mechanism of conflict expansion where reformers “take their case” to various venues hoping for favorable attention. Policy reform proponents attempt to convince policy makers of the merits of their ideas by criticizing the prevailing policy and articulating alternatives and perhaps a strategy for government action. The goal of venue shopping is to receive some favorable action regarding policy change.

Critical to policy change is the articulation of new ideas. New ideas, coupled with issue definition, are critical because changes in the way issues are defined often lead to the appearance of the issue on political agendas. Criticism of a prevailing policy is central to policy change because it stimulates political conflict. A proposition to be tested in this paper concerns the idea that where policy issues have been assigned to subsystems, increasing attention is related to an increasingly negative policy image. The tone of a surge of attention is generally critical in nature. Most issue change occurs during periods of heightened attention to the policy. For example, each time there is a surge of media interest in a given topic, we can expect some degree of policy change.

As new ideas emerge onto institutional agendas, or as an issue is redefined because of the accumulation of knowledge, increased awareness by officials or the public, or through heightened attention from the media, it may challenge the prevailing positive image of a policy. Opponents who seek policy reform will attempt to manipulate the policy image through the development and communication of a new issue definition that

criticizes the prevailing policy image. Issue redefinition is critical, for example, in technically complex issues that are usually discussed in terms of their scientific and engineering details. When such issues are portrayed as technical rather than social, experts tend to dominate the decision making process. When the social, political, or ethical implications of a policy increase in importance, usually through criticism of the prevailing policy, a broader range of participants will become involved in the decision making process because the policy image has undergone a redefinition that highlights these other facets of the policy.

Moreover, as positive feedback occurs, where a new issue definition works its way through the policy process, the result may be a “bandwagon effect” where the idea becomes both diffused through the political system, and also accepted by other institutions and decision makers who are receptive to the new issue definition.

Baumgartner and Jones (1993) suggest that as political conflict expands there will be a succession of venue-access events. Reform proponents will seek out venues that promise to be amenable to reformist rhetoric and render decisions favorable to reform-oriented policy goals. We can identify venue-access events by noting the levels of attention to the policy problem across numerous venues. Each success in a particular institutional venue leads to some change in the policy image. Moreover, as the formerly positive image deteriorates, a greater number of potential venues may become receptive to the criticism of the prevailing policy.

The consequence of the emergence of new ideas onto the political agenda is the creation of new institutional arrangements that effectively destabilize or destroy the structural framework of a policy monopoly. Baumgartner and Jones (1993) suggest that

as new ideas come onto the political agenda the result will be the development of new institutional arrangements. These arrangements may open the decision making structure to new participants, shift authority patterns among public organizations, or some combination therein.

The role of new ideas and issue definitions plays a central role in policy change. Baumgartner and Jones hypothesize that “environmentalism is a politically popular idea which, if linked to a particular policy, may lead quickly to its demise” (1993, 86). Yet it was not simply the idea of “environmentalism” which led to the demise of the nuclear weapons production policy monopoly. This paper will illustrate that the idea that drove the image change of nuclear weapons production policy, was the emerging belief during the late 1970s and early 1980s that nuclear weapons production activities (i.e., exposure to radioactivity and hazardous wastes) were harming public health. This paper will illustrate that the image of nuclear weapons activities changed from the image of “maintaining national security” to “threatening public health and the environment.” Until the early 1980s, the image of nuclear weapons production was one of a policy playing a central role in the nation’s defense. Once a threat to public health and the environment was articulated, however, the positive image associated with weapons production activities began to erode, and policy changes began in earnest.

Jones, Baumgartner and Talbert (1993) have employed the punctuated equilibrium model to examine changes in Congress. The authors theorize that the congressional committee system is best depicted also a dynamic process with each committee holding jurisdiction over an issue for a time, then losing out to other committees that are able to assert some control over some aspect of a policy issue. As issues became more

controversial, jurisdictional monopolies were likely to come under attack from other interested players be they individual representatives, or committees. The authors found that as issue attention, measured by the number of hearings, increased, so to did the number of involved committees. In addition, as interest in a policy issue expands the percentage of hearings favorable to the existing policy monopoly declines. In short, increased attention to a policy issue tends to be negative and have a detrimental effect on the ability of committees or members of Congress to maintain their issue monopoly.

When applied to Congress the punctuated equilibrium model explains the existence of periods of stability, characterized by committee system structure and consensual understandings of particular issue dimensions. The model also highlights the process wherein issue monopolies in Congress are destroyed by the intrusion of new ideas and issue understandings, and new participants in the policymaking process, usually committees or subcommittees successfully gaining new jurisdictional footholds. Controversy, issue definition, and competition for control over policy jurisdiction constitute important elements in the policy making process within Congress. Baumgartner and Jones theorize that these same dynamic processes, with similar results for policy, are at work not only within a single political institution, but also within the larger political and policy-making environment.

The punctuated equilibrium model appears to have several analytical advantages. First, the major feature of the model is the interaction of policy image and policy venue; this dynamic interaction can explain the creation, maintenance, and decay of policy subsystems. The institutional product of the image-venue interaction can provide stability for policy under conditions of enthusiasm. Under conditions of criticism, the

institutional product of image-venue interaction can destabilize existing equilibrium, and destroy policy monopolies.

Second, the emphasis on policy image distinguishes the punctuated equilibrium model from policy change studies that focus primarily on structural features. Institutional arrangements are clearly important, as past studies of policy subsystems indicate. Yet, the punctuated equilibrium model's inclusion of a powerful supporting idea associated with institutional arrangements provides an important dimension for understanding how policy monopolies are created, sustained and destabilized over time. The emphasis on policy image also provides an excellent opportunity to understand the vehicle of political conflict, and how issue definition rests on the ability of reform and policy status quo proponents to effectively manipulating policy image to achieve their divergent goals. Moreover, policy image provides a useful approach for tracing the expansion of political conflict across institutions.

The punctuated equilibrium model also appears to have a methodological advantage over a rival explanatory model of policy change, the advocacy coalition model. The advocacy-coalition model places a heavy emphasis on policy-oriented learning and how learning changes the beliefs and perceptions of policy elites (Sabatier and Jenkins-Smith 1993). The AC model equates policy oriented learning with a change in the beliefs of policy elites. The potential drawback to this approach is measuring policy elite beliefs and belief change. Such beliefs may indeed change over time, but measuring core and peripheral belief change poses some significant operationalization and measurement challenges. In addition, drawing conclusions that policy beliefs changed because of

knowledge utilization is challenging because of the inherent difficulties illustrated by knowledge utilization studies (Bennett and Howlett 1992).

The punctuated equilibrium model places an emphasis on policy images. The emphasis on policy image does not discount the possibility that learning plays an important role in policy change. Learning may indeed be a part of the phenomenon that produces new ideas, allows policy reform proponents to propose alternatives, or helps move ideas onto political agendas. Yet it appears that measuring policy image, through content analysis of government documents and media reports is simpler than measuring belief change among policy elites. Moreover, policy images may be a more useful concept given the importance of images in political debate, and essentially provides a concept that can encompass learning without necessarily facing the challenges of operationalization and measurement.

Another apparent advantage of the punctuated equilibrium model is that it does not necessarily focus on policy elites. While the advocacy coalition model emphasizes the core and peripheral beliefs of policy elites, this approach may exclude important entities (i.e., grassroots organizations) which play a critical role in policy change dynamics, but would not necessarily meet the criteria of a policy elite. The advocacy coalition model does place an emphasis on bottom-up dynamics, but focuses on the role played by state governments and therefore might discount the ability of local organizations to play a role in fostering policy change.

Chapter III: Testing the Punctuated Equilibrium Model, Hypotheses & Research Design

In order to determine the usefulness of the punctuated equilibrium model several hypotheses will be tested in this paper. In brief, the punctuated equilibrium model emphasizes the importance of the interaction of policy image and venue, facilitated by political conflict. In their effort to change public policy, reform proponents will attempt to manipulate the policy image in a way designed to gain political support. Generally, this approach focuses on negative elements of a policy and may include possible solutions to policy problems. The effort by reform proponents is designed to gain political allies by expanding conflict across the political system and seeking out, or “shopping” for, political venues receptive to the changing policy image. As the positive image of a policy declines, a greater number of political venues become receptive to questions or criticism raised by reform proponents. As reformist ideas achieve prominence on political agendas, the rhetoric becomes more prominent in the policy debate. The interactions of image and venue therefore produce a self-reinforcing dynamic characterized by positive feedback where rhetorical changes stimulate venue changes, and vice versa.

Baumgartner and Jones argue that policy monopolies are destroyed, in part, as a result of a flood of new actors coming into previously restricted systems of public policy making. How this flood of new actors develops and its impact on policy change involves the relationship between agenda access, policy outputs, and the decay of policy

monopolies. The dynamic process by which new actors flood restricted systems of decision making and act to decay policy monopolies is therefore important for explaining policy change.

H 1: *The inclusion of new ideas on policy agendas is associated with the development of new institutional structures and arrangements.*

H 2: *The creation of new institutional structures and arrangements is associated with increased participation by previously excluded institutions or groups.*

These relationships will be illustrated by tracing the emergence of new ideas on policy agendas. The new ideas generally associated with such concepts as threats to public health and the environment from nuclear weapons production activities. New institutional structures and arrangements are manifest in policy outputs from Congress, the federal courts, federal agencies, and state governments. These institutional structures and arrangements create new authority patterns, expand oversight responsibility or avenues for legal recourse, citizen participation, or order specific actions. The second method of demonstrating these hypothesized relationships will be in analyzing how policy outputs provide opportunities for previously excluded political actors to assume a more active, or influential, role in the policy and what the nature of this role is. A key assumption of the punctuated equilibrium model is that as new actors exert influence in a policy area, the policy monopoly becomes increasingly fragmented.

Another key hypothesis of the punctuated equilibrium model is the relationship between an increase in attention to policy and the nature of the attention to that policy.

H 3: *As media attention to an existing policy increases, there will be an increase in the negative tone of media coverage.*

This hypothesis can be illustrated by examining the levels and tone of attention of national and local media sources. For national and local media sources we would expect to see an increase in the total number of stories and an increase in the percentage of negative stories reported during the study period.

H 4: *As congressional attention to existing policy increases, there will be an increase in the negative tone of congressional attention.*

For Congress we would expect an increase in the total number of congressional hearings concerning a policy issue with an increase in the percentage of negative hearings as determined by a content analysis. An additional piece of evidence examining attention and tone would come from a content analysis of policy reports issued by the General Accounting Office. An increase in the number of reports issued by the GAO during the study period is also expected. A content analysis of GAO reports would indicate negative findings concerning environmental, safety and health matters in the weapons complex, as well as information regarding the requesting congressional committee or subcommittee.

H 5: *As a policy image becomes more negative there will be an increase in the number and type of committees and subcommittees attempting to gain a jurisdictional foothold.*

These relationships will be measured by noting the decline in policy image, as illustrated by negative congressional hearings, along with the expansion in the number and type (i.e., oversight) of committees and subcommittees holding hearings on nuclear weapons policy. In addition, congressional hearings will illustrate the activism of entrepreneurial activity by members of Congress who propose new legislation.

H 6: *As the social aspects of a policy issue become more prominent, a broader range of congressional committees and subcommittees become involved in the issue conflict.*

This hypothesis will be illustrated by noting the types of committees and subcommittees holding hearings, along with the subject matter, and witnesses testifying before Congress during the study period. We would expect to see policy jurisdiction expand from armed services and appropriations committees, to committees and subcommittees with environmental, safety and health, and oversight responsibilities. In addition, noting the status or position of witnesses offering testimony to Congress will illustrate the expansion of conflict, as including environmental matters in the weapons complex, as well as the changing policy image as articulated by witnesses. Moreover, national and local media sources will indicate efforts by reform proponents to articulate the social aspects of policy issues in the weapons complex in non-congressional forums.

Policy studies indicate the important role played by experts in maintaining the viability of subsystems particularly regarding the positive image associated with a subsystem. The notion of a policy monopoly assumes that internal decisions are amiable, and that policy dissent occurs behind the scenes. Analysis also indicates that political conflict which eventually destroys policy subsystems can come from sources internal to the system. Therefore internal dissent is hypothesized as playing a role in altering policy images, stimulating political conflict, and contributing to the decay of policy monopolies.

H 7: *An increase in internal dissent is associated with the development of a negative policy image.*

This hypothesis will be demonstrated by examining the nature of internal dissent within the AEC and DOE over nuclear weapons issues such as environmental, safety and health matters. We expect to find dissent internalized at first, but then expressed publicly as experts begin to question official policy. Essentially this dissent is also an expression of image change and contributes to an expansion of political conflict as experts take their case to the press, or present it to other political institutions, thus revealing internal conflict in a previously stable and contentious subsystem. Moreover, this dissension undercuts the legitimacy of the structure of the policy monopoly because it raises questions about the expertise, but also whether the monopoly is objective in its analysis and distribution of information.

One of the important elements of the punctuated equilibrium model is the role and impact of interest mobilization in the process of policy change.

H 8: *As the scope of a policy problem expands, local efforts to change policy increases.*

This relationship can be examined by looking at local level interest groups. We would expect that as public health and environmental contamination concerns of nuclear weapons become more prominent, interest groups will form at the local level and become involved in a variety of political activities opposed to nuclear weapons production policy.

A more fulsome explanation of policy change should include the dynamics of image and venue interaction found at the state and local level of politics and how those dynamics affect national agenda setting activities.

H 9: *Changes in policy image at the local level lead to changes in policy image at the national level.*

The expectation here is to find image changes occurring first at the local level. Local media sources will indicate increasing attention and an increasingly negative tone of that attention. Comparing national and local images and venue actions, this paper will demonstrate that the impetus of policy change in the weapons complex came first from “bottom-up” sources, and was followed by “top-down” sources.

A key feature of the punctuated equilibrium model is the role played by new ideas or understandings of a policy issue, and how this dynamic stimulates policy change. New ideas and understandings are often the result of problem definition. Problem definition illustrates the importance of causal stories. Causal stories have both an empirical and a normative dimension. On the empirical level, causal stories demonstrate the action or mechanism that brings about harm. On the normative level, causal stories establish blame and motives for consequences.

H 10: *Shifts from factual disputes to normative arguments over policy definitions are associated with an increasingly negative policy image.*

This hypothesis will be tested by examining the causal story of problems in the weapons complex, coupled with the effort by reform proponents to manipulate policy image. As long as the debate centered over disputable facts, such as acceptable radiation exposure levels, policy changes occurred at an incremental pace because the image remained positive. However, there was a gradual emergence of a key normative dimension in the debate that was a stimulus for change: trust and the emergence of a confidence gap. As the debate evolved, a causal story emerged which focused on the fact that government activities in the area of nuclear weapons production essentially violated the public trust. As the scope of the problems associated with nuclear weapons expanded,

the policy monopoly was unable to control the decay simply by disputing facts. With each succeeding revelation of problems, the normative issue became increasingly prominent in the political conflict.

The punctuated equilibrium model appears to hold great promise in explaining the complexity of policy change. By focusing on the interaction of venue and image the model appears to encompass a wide variety of political dynamics that scholars have identified as playing a central role in stimulating rapid change even after years of apparent stability. Moreover, the model is parsimonious and its conceptual framework is straightforward. In addition, its hypothesized relationships are amenable to operationalization and suggest a variety of empirical referents, particularly concerning activities of various policy venues as well as the nature of policy images in these venues. Finally, by emphasizing conflict expansion and venue shopping, the punctuated equilibrium model focuses analytical attention on the actions of actors in a variety of political settings at different levels in the political process. Finally, the research design requirements, along with data acquisition and measurement, are sophisticated without being overly complex given the challenge of explaining policy change. It is to the research design of the dissertation that we now turn.

Research Design

The punctuated equilibrium model requires a particular approach to data collection. First, the diffusion of decision making power in the American system means that there is not a single government agenda, but rather a number of potential agendas to consider when examining the dynamics of policy change. Indeed, given the punctuated equilibrium hypothesis of simultaneous venue access events, our research design must

take into consideration such diverse agendas as presidents, federal courts, congressional committees, administrative agencies, and state and local governments. As the policy change literature indicates, each of these players or policy venues can have an impact on policy change, and policy reform proponents will attempt to seek out the venue most receptive to reform proposals. Moreover, uncovering the activity of policy entrepreneurs requires that we cast a wide net in our agenda data collection efforts.

In their analysis of the demise of the nuclear power policy, for example, Baumgartner and Jones (1991, 1993) document changes first, in the regulatory environment, noting an increase in regulations directed at nuclear power; second, in the nature of congressional oversight, noting an increasingly vigorous and negative tenor within a fractured policy jurisdiction; third, the increase in policy activism of state and local governments, coupled with citizen referenda and protest; fourth, the emergence of a more liberal notion of standing in federal and state courts, along with opinions handed down in key court opinions; fifth, the fluctuating reactions of financial markets which made nuclear power economically infeasible; and finally, the changing public image of N-power as expressed in opinion polls. In short, the evidence from the interaction of image and venue must be drawn from a wide variety of sources. This paper takes a similar approach to data collection by examining a wide variety of available information from the study period 1944-94.

National Media: Attention and Tone

Because the punctuated equilibrium model hypothesizes that an increase in attention is central to image change, and because the media plays a pivotal role in agenda-setting dynamics by drawing attention to events and issues, key media publications are

important sources of information. Studies of the role of the mass media in setting the policy agenda have commonly used intensity of coverage as an indicator. Baumgartner and Jones' approach focuses on the national media and uses stories from The *New York Times* index and the *Reader's Guide to Periodical Literature*. We are interested in both levels of media attention concerning nuclear weapons policy and the tone of that attention. Media attention can be measured by the number of stories published per year during the study period. Tone can be determined through the use of a basic content analysis that places each headline in a positive, negative, or neutral/uncodeable category.

The punctuated equilibrium model indicates that a fairly simple content analysis can illustrate changed in attention and tone. This basic format will be followed in this paper and will include subject matter that is connected to weapons production policy. Along with the date of media coverage, the stories will be placed in three topic areas. The following categories will be utilized for coding stories from the *New York Times* and the *Reader's Guide*:

1. Date (attention)
2. Stories dealing with nuclear weapons production (negative, positive, or neutral image)
 - a) Environmental, safety, and health matters
 1. worker/citizen exposure to radioactivity
 2. high level nuclear waste at weapons production sites
 3. contamination resulting from production
 4. protests against weapons production
 - b) Routine policy matters
 1. new construction/facilities

2. contractor-related issues
3. budgetary/miscellaneous issues

Congress

One of the most important sources of information concerning both policy venue and image is Congress. Because Congress is an important part of numerous policy monopolies, its competitive nature and fragmented power structure make it a prime institution of appeal for policy reform proponents. Baumgartner and Jones (1993) and Jones, Baumgartner and Talbert (1993) suggest that the decline of a policy monopoly can be traced, in part, to changed in congressional behavior. Two related mechanisms reinforce and structure changes in congressional behavior. First, jurisdictional boundaries are often in flux particularly as a policy issue becomes more visible and controversial. Members, committee staffs, lobbyists, and executive branch agencies can prompt committees to become active in a new policy issue and thus attempt to invade another committee's jurisdiction. As policy visibility and controversy increase jurisdictional boundaries become more difficult to maintain. Changing policy definitions, and consequently policy images, are closely linked with congressional jurisdictions. Baumgartner and Jones argue that policy change within Congress is often driven less by the changes attitudes and beliefs of members than by jurisdictional or procedural changes that allow policy reform advocates to bypass their opponents (1993).

Second, policy entrepreneurs in Congress can push committees to become active in new policy areas. Entrepreneurs are also a necessary target of lobbying by organized interests. Without this inside connection, many groups would have great difficulty in initiating policy change. Moreover, an entrepreneur thrives on the attention and support

of such outside groups because in the absence of such support jurisdictional change, and ultimately policy change, might never transpire (Baumgartner and Jones 1993). As new issues come onto the congressional agenda, through the emergence of a crisis, a focusing event, the activity of a policy entrepreneur, or increased media attention to a subject, they may trigger an explosion of interest across the institution. In his analysis of energy policy change during the 1970s and 1980s, for example, Jones describes jurisdictional inflation in Congress as resembling the “Oklahoma land rush” where the number of committees and subcommittees claiming jurisdiction over energy issues dramatically expanded the number of representatives, staffs, and lobbyists operating in the policy area (1979).

Increasingly negative attention can highlight the multiple aspects of a single issue and prompt different committees to join in the jurisdictional competition that characterizes Congress. In the case of nuclear weapons policy, for example, we would expect to see that as the policy debate shifted from being strictly concerned with national security affairs to issues of environmental, safety, and health, the debate proliferate in Congress. Moreover, as the controversy about these issues grew, attention to the policy expanded across the institution.

Tracking congressional hearings will provide key data for examining policy image and venue by illustrating the extent, tone and subject matter of the policy debate. Hearings can provide information about participants and testimony in the debate, including individuals and groups from both inside and outside a policy monopoly. The data analyzed in this paper will be drawn from the Congressional Information Service (CIS) available through Lexis-Nexis. The CIS data from Lexis-Nexis is organized according to key words and covers the period from 1969 through the present. The key-

word searches will include the names of federal agencies responsible for weapons production as well as the names of specific sites in the production complex. The data from congressional hearings will be organized into the following categories:

1. Date and title of hearing (tracking the increase in congressional attention)
2. Committee/Subcommittee (tracking jurisdictional fragmentation)
3. Topics included in individual hearings about the nuclear weapons complex
 - a) Environmental, safety, or health matters in the complex
 - b) Routine authorization and/or appropriations topics
4. Policy position/orientation of witnesses
 - a) Witnesses from the nuclear weapons production policy monopoly
 - b) Witnesses from policy reform organizations
 - c) Other witnesses (academics, non-monopoly government officials, etc)
5. Legislation under consideration concerning changes in policy making institutional structures of the weapons production policy monopoly (present/absent)

Coding the data according to these categories will illustrate both attention and tone as reflected by Congress. Including information about witnesses and testimony will indicate the involvement of organizations and individuals in the policy debate. In particular, noting the presence of state, local, and tribal authorities, as well as grassroots organizations, will provide evidence of policy activity by political actors who were exogenous to the weapons production policy monopoly, but who were pressing for change. Finally, including information about bills under consideration will provide evidence of entrepreneurial efforts by members of Congress directed toward altering the

institutional structure of the nuclear weapons production policy monopoly. The type of data that would fall under this category would include, for example, a proposal to shift the responsibility for health analysis from the Department of Energy to the National Institutes of Health.

The General Accounting Office

An additional source of information concerning policy change can be found by analyzing reports generated by the General Accounting Office (GAO). The GAO is a congressional staff agency responsible for research and analysis of public policies and their implementation by government agencies. Although the GAO is not a venue to which policy reform proponents can air their cause, the activity of the agency represents an indicator of congressional interest in a topic, and can serve also to illustrate the level and tone of attention, as well as the nature of the policy problem. Moreover, the GAO often provides recommendations to Congress about specific public policy problems. Much like data drawn from congressional testimony, GAO information can illustrate the increase in attention to nuclear weapons production policy and the policy issues. This study will track the rise of GAO reports on the environmental, safety and health problems in the nuclear weapons complex as a means of illustrating the increased negative attention to nuclear weapons production policy.

Courts

The policy change literature clearly identifies the judiciary as a key exogenous factor for explaining policy change. It is important to include federal and state courts for two basic reasons. First, numerous studies of policy change illustrate that in some issue areas the courts have been decisive in initiating change, particularly in directing

administrative agency action (McSpadden 1995, Meier 1985). Second, many environmental statutes, particularly those concerning hazardous and toxic wastes, contain provisions that allow citizens groups or state and local governments to seek redress in the federal courts (Dycus 1996). In this respect, the court system is available for venue shopping for policy reform proponents who might be unable to press their case in Congress or with a particular federal or state administrative agency.

The number of court cases involving nuclear weapons production policy was small compared to newspaper stories or congressional hearings. Nevertheless, some court opinions carried substantial weight in terms of fostering policy change. In this paper the role of courts in nuclear weapons production policy change will be illustrated in a similar fashion to media and congressional attention and tone, with the addition of a category which provides information on how a court decision impacts the policy monopoly, and affects policy change. In addition, a number of federal actions related to the weapons production complex were the subject of litigation, but were resolved without the case going to trial. These “non-decision” cases will also be included in the analysis because they too had a bearing on policy change. Data from court cases will be presented according to the following categories:

1. Date of decision or action
2. Title of case
3. Case subject and litigants
4. Outcome for policy change

The Atomic Energy Commission/Energy Research and Development Administration/Department of Energy

Because the Department of Energy, and the Atomic Energy Commission prior to 1975, were the agencies responsible for nuclear production policy, information from and about those agencies will be important sources of data for this paper. There are a number of excellent historical accounts of the Atomic Energy Commission that will be important for this study. Several studies including, Ball (1986), Ford (1982), Green and Rosenthal (1963), Hewlett and Duncan (1969), Sylves (1987), provide insightful, and sometimes insider accounts, of the history of the Atomic Energy Commission. These studies will be good sources of information for documenting the creation and maintenance of the weapons policy monopoly from the mid-1940s to the abolition of the AEC in 1975. These studies will provide important information about AEC decisions, internal dissent, relationships with outside players including Congress, contractors, and policy reform advocates, and the gradual decline of the agency's monopoly leading to its ultimate demise.

In addition, agency documents will be utilized whenever possible. A large amount of AEC/ERDA/DOE information has been declassified and will be useful for analyzing administrative and internal agency issues. This information can be critical for examining policy outputs from the agencies by documenting the emergence of new goals, program development, decisional processes, internal reorganizations and changes in resource and personnel allocation. Documenting these policy outputs will illustrate how the primary mission of weapons production gradually gave way to including environmental, safety, and health concerns. We will be able to document this policy change, in part, through an analysis of agency resource allocations that shifted from

production to hazardous waste cleanup activities. Agency documents also promise to shed light on the important relationship between AEC/DOE and its private sector contractors who operated the complex facilities.

Interest Mobilization

One of the key elements for explaining policy change is how interests are organized and mobilized for political action. As Schattschneider (1960) argued even before the era of the public interest lobby, much of this counter mobilization is motivated by criticism of prevailing policy. The policy change literature clearly indicates that the expansion of organized interest activity, particularly public interest organizations, has altered the landscape of the American public policy process (Baumgartner and Jones 1993, Bosso 1987). In many policy areas, organized interests have come to represent an important source of countervailing power to the established players in the policy making process (McFarland 1992). Organized interests play key roles in the agenda setting dynamics by developing issue definitions and causal stories, and in advancing ideas and policy reform proposals. Moreover, organized interests engage in “venue shopping” in the effort to expand conflict and gain policy reform allies. In short, from the one-sided mobilization of past decades, many policy sectors of American society have been moved toward a much more crowded, complicated, and possibly more representative system of interest representation because of mobilization.

This paper will examine two levels of counter mobilization that emerged against nuclear weapons production policy. Examining this counter-mobilization focuses attention on both national and grassroots levels. At the national level, a handful of public interest organizations mobilized first to question nuclear weapons testing policy, and later

nuclear power policy. Many of these same organizations later lent their support to nuclear arms control policy (Gottlieb 1993). During the early 1970s, some national groups shifted their focus to the nuclear weapons complex and devoted significant resources in this direction particularly by seeking relief in the courts (Reicher and Scheer 1988). This paper will attempt to illustrate how national groups came to focus their attention on the nuclear weapons complex, and their subsequent policy reform efforts. Measuring the policy reform efforts of national groups can be done by examining national and local media sources, interviewing current or former members of these groups, and possibly by examining group archives that might be available to the public. One of the interesting factors this data will reveal is the extent to which national groups remained active in the policy area even after the major policy changes were put into place. In other words, were national-based interest groups merely active in the policy reform cause until changes were made, or did they maintain a presence beyond the establishment of a new policy direction? Posing this same question for grassroots organizations is also addressed below.

Examining the “Bottom-Up” Dynamics of Policy Change

One of the advantages of the punctuated equilibrium model is the fact that it allows for both “top-down” and “bottom-up” origins for policy change. From this perspective the national media and national political institutions and organizations play a key role in the image-venue interaction. Similarly, state and local level politics can also play an important role in policy change. As many scholars of federalism have aptly illustrated, state and local governments have played an increasingly important role in the

public policy process, particularly in the area of environmental policy (Davis and Lester 1989, Lester 1995). This paper argues that venue-image dynamics at the state and local level can precede, or sets the stage for, policy change at the national political level. In short, the dynamics of policy change may often be generated by image and venue interaction at the state and local level of politics and that those dynamics are connected with and affect national agenda dynamics. One measurement of such bottom-up dynamics is to examine state-level venue succession events. In other words, can we find examples where state and local governments take some sort of action directed at policy change, and does this bottom-up dynamic precede top-down dynamics?

Perhaps as important as illustrating venue-image interactions at the state and local level is the ability to illustrate the means through which state government actors are involved in policy change. These dynamics will be analyzed by looking at developments in state and local political venues, activities of grassroots organizations to expand conflict and engage in venue shopping, local media attention and tone, and interactions between local and national political officials. The basic purpose of a broad-based analysis of bottom-up dynamics is to determine the extent to which state and local governments, groups and individuals affect the process of policy change.

State-Level Political Venues

Although national security issues have traditionally been the exclusive policy province of the federal government, this paper will argue that state governments were an important institutional venue in the process of changing nuclear weapons policy by urging greater adherence to public health and environmental protection regulations in weapons

production activities. Representatives of state governments did not lobby to become involved in the strategic policy decisions about nuclear deterrence, or the number of weapons to be built, but became key players in attempting to compel the federal government to abide by environmental, safety, and health regulations at the nuclear weapons production complex. State officials were increasingly involved in congressional testimony and articulated views that were ultimately manifest in political institutions which ended the policy of self-regulation in weapons production activities. Moreover, state and local officials were often the most vocal spokespersons in articulating the opposition to nuclear weapons production activities and were instrumental in crafting an issue definition which focused on threats to public health and the environment, as well as the erosion of public trust. Finally, state and local governments passed various laws and regulations, and utilized the federal courts, in their policy reform efforts. This paper argues that the positive image of nuclear weapons production policy began to erode at the local level well before the story of environmental, safety, and health problems emerged onto the national scene. State government officials were particularly important players in attacking the positive images associated with nuclear weapons production. Moreover, state governments were instrumental in attacking the structural features of nuclear weapons policy, by arguing for a greater role in oversight of the environmental, safety and health dimensions of nuclear weapons production policy.

Although the federal government had dozens of sites involved in various nuclear weapons production activities, the process was carried out primarily at fifteen major facilities. Of these sites three, Fernald, Ohio, the Hanford Reservation in Washington, and Rocky Flats near Denver, Colorado, will be examined in some detail in this paper.

These three nuclear weapons production facilities were chosen for examination in this paper for several reasons. First, all are located in different geographic regions of the United States. Second, the sites differ in their size (Hanford being the largest at nearly 600 square miles, and Fernald one of the smallest at about 100 acres) and proximity to major population centers (Rocky Flats and Fernald are within 20 miles of major metropolitan areas). Third, a preliminary analysis indicates that the speed of policy change, as well as media attention and grassroots activity, varied across the three sites. Fourth, some degree of cultural and political demographic differences exists across the three sites. Hanford is located near large Native American reservation systems in central Washington. Rocky Flats is near Boulder, Colorado, an academic community known for its political activism, divergent attitudes and opinions. Finally, accessibility of data played a role in the selection of the three sites.

There are several sources of data available for illustrating the activity and impact of state and local political venues. Congressional hearings will indicate the extent to which state and local officials were involved in image and venue interactions. Much like noting the national or grassroots orientation of interest group representatives testifying before Congress, we can also note the state or local government position of those officials who offered their testimony. The growth in the number of state and local officials who testified before Congress will illustrate the rising resentment toward nuclear weapons activities DOE operations by state, local, and tribal governments. These players were increasingly demanding greater authority in the policy process considering that the various problems associated with nuclear weapons production were threatening the local environment and the public health of citizens.

This paper will also examine state government efforts to compel AEC/DOE to abide by environmental, safety, and health regulations. Much of the information illustrating state government activity can be gleaned from local media sources. This data will reveal the emergence of opposition to nuclear weapons production policy expressed in both image changes and in policy proposals designed to allow state governments to play a stronger role in nuclear weapons production policy. In addition, court cases will indicate the effort of state governments to utilize litigation strategies in policy reform efforts.

Grassroots Mobilization and Activism

Perhaps more important for stimulating nuclear weapons production policy change was the growth and activism of grassroots organizations which emerged from the communities in proximity to weapons production plants (Reicher and Scheer 1988). The emergence and political activism of grassroots groups was symptomatic of the wave of environmental groups formed out of concerns associated with local threats to public health and the environment posed by toxic substances and hazardous wastes (Gottlieb 1993). The majority of these groups were grassroots organizations formed to address a local problem and were not necessarily associated with the better-known national environmental organizations and their traditional concerns.

This paper argues that change in nuclear weapons production policy was stimulated, in large part, by agitation that occurred at the grassroots level. There are a variety of data sources available to examine the grassroots element of interest mobilization. One source is the groups themselves, some of which are still active.

Establishing contacts with groups and individuals will be useful to develop an account of the initial formation and subsequent activity of grassroots groups in their efforts to change nuclear weapons production policy. To the extent that key group members can be contacted, phone interviews will be guided by a small set of basic questions which will allow the individual leeway in telling the story of their group. Moreover, many groups have posted web-sites with basic information about contacts, activities, and history. As explained below, content analysis of the *Cincinnati Enquirer*, *Denver Post*, and *Seattle Times* will contain information about grassroots groups and their political activities. This information will also illustrate efforts in which national and grassroots groups combined forces to oppose nuclear weapons production policy (Charles 1988, Steele 1988). Finally, congressional hearings and testimony will illustrate the presence of both national and grassroots interests in pressing for policy change. In addition to noting the position or orientation of a group that testifies before Congress, the congressional hearings content analysis will note interest group representation, and the tone of that testimony, along with the time frame in which grassroots organizations were active.

Local Media: Attention and Tone

Although Baumgartner and Jones restrict their media analysis to national sources, such as the *New York Times* and the *Reader's Guide*, this paper hypothesizes that the changing image of nuclear weapons production policy originated at the state and local level. By documenting local media attention and tone we will see how the policy image change was already well underway at the grassroots level before the expansion of national attention occurred in the aftermath of Chernobyl. For example, local and regional

newspapers near Rocky Flats, Fernald and Hanford had covered the growing controversy at weapons facilities well before the national press picked up the story.

In order to test the local image hypothesis, this paper will also examine media attention and tone from newspapers located in proximity to the three selected nuclear weapons production sites. The content analysis will include information from the *Cincinnati Enquirer* (Fernald), the *Denver Post* (Rocky Flats), and the *Seattle Times* (Hanford). Using the same content analysis format as the national media, we will be able to trace the increase in attention, and changes in tone at the local level from 1970 through 1994. Along with providing information concerning image change, examining local media coverage will illustrate the activities of grassroots organizations and efforts by state and local governments to exert influence in the emerging controversy over the weapons complex. By comparing local and national media attention and tone during the study period we can test the proposition that image changes occurred at the local level before it changed at the national level.

A Longitudinal Approach to Explaining Policy Change

From a research design perspective any explanation of policy change requires an extended time dimension (Baumgartner and Jones 1993). The very nature of the American political process calls for a longitudinal approach for explaining policy change. For example, given the fact that many pieces of legislation go through extended periods of debate in Congress before law is passed, or where court opinions build upon precedent over many years, a longitudinal approach promises to provide the necessary historical framework to trace the complexity of policy change. In addition, the rise and fall of a

policy issue on political agendas suggests the need to approach understanding policy change from a time perspective which allows developing a understanding based on illustrating the forces which move issues on, or conversely, keep them off agendas. Moreover, given the secular changes which policy change scholars have documented, a longitudinal approach promises also to illustrate the evolution and nature of those changes and how they impact the American policy process. Answering this complicated question requires a development of the historical record where we can trace the development and interaction of the dynamics of policy change. A longitudinal approach allows a broader perspective to be developed which can reveal trends and dynamics which might not otherwise appear in cross-sectional analysis (Baumgartner and Jones 1993).

A number of studies, Howlett's review of Canadian aboriginal policy (1994), Bosso's examination of pesticide policy (1987), Nelson's study of child abuse policy (1984), Eisner's analysis of anti-trust policy (1990), and Bernstein, Bricher and Einwohler's study of work, family, and gender policy (1995), all demonstrate the virtue of a longitudinal approach for in-depth analysis of a single policy issue area. These studies provide the opportunity to adequately explore the complex interplay between ideas and institutions that occur over several decades. They also illustrate the emergence of key ideas that played a central role in policy change. These studies also illustrate the role played by interest mobilization dynamics in agenda setting, policy entrepreneurs, and the work of positive feedback mechanisms where each success of policy reform proponents increases the likelihood of further success. Although there does not appear to be a set period of time recommended for a longitudinal analysis, many studies have

followed a policy for a minimum of a decade (Sabatier and Jenkins-Smith 1993). This approach provides an opportunity to view the policy over an extended period of time and develop an understanding of the complex dynamics involved in policy change.

Chapter IV: Creation and Maintenance of the Nuclear Weapons Production Policy Monopoly, 1945-1970

This chapter provides an overview of the creation and maintenance of the nuclear weapons production policy monopoly and examines the historical record with the goal of placing the available information about nuclear weapons production policy within the framework of the punctuated equilibrium model. This chapter will cover a 25-year period, beginning with the initial establishment of the nuclear weapons policy monopoly during the Second World War. This chapter will examine the institutional framework of the nuclear weapons production policy monopoly, as well as the set of supporting images that sustained the monopoly in the years following World War II. The twenty-five years following the Second World War were years characterized by a remarkable degree of stability in nuclear weapons production policy. As predicted by the punctuated equilibrium model, this stability was established and maintained by a solid institutional structure and a set of positive images. The chapter will close by examining the opposition to nuclear weapons production policy as it existed by the end of the 1960s. Although the institutional structure of nuclear weapons production policy monopoly remained solid through the 1960s, a new set of ideas and images had emerged by that time which began to challenge the stability of the monopoly.

Origins and Features of the Nuclear Weapons Production Policy Monopoly: Policy Venue and Policy Image

The punctuated equilibrium model assumes that a policy monopoly has two key characteristics. First, there is a definable institutional structure for policy making and this structure limits access to the policy process. The institutional structure is composed of the administrative and decision making organizations that have authority in a given policy area, as well as the laws and rules which define policy mission and responsibilities. The monopoly on policy authority exists because players with a vested interest in the policy attempt to exclude real or potential political opponents by developing and maintaining rules that limits access to the decisional structure. The second characteristic of a policy monopoly is a powerful supporting idea, or set of ideas, buttressing the institutional structure. The supporting ideas are communicated through image and rhetoric and may also play an important role in monopolizing the policy making authority by excluding real or potential opponents who may lack the proper professional credentials and expertise.

According to the punctuated equilibrium model, policy stability over time is maintained by a combination of the existing structure of political institutions with policymaking authority, and the definition of issues processed by those institutions. The policy monopoly emerges from and is maintained by what Baumgartner and Jones describe as a “wave of enthusiasm” wherein key segments of the political system place new policy ideas on political agendas, work to create institutional structures and supporting policy images which surround and give life to the policy. These same supportive elements work to maintain policymaking structures and images in ways that perpetuate the policy (Baumgartner and Jones 1993).

Early Roots: The Manhattan Project

The institutional roots of the nuclear weapons production policy monopoly can be traced to the establishment of the Manhattan Engineering District, more commonly known as the Manhattan Project, during World War II. In December 1942 President Franklin Roosevelt authorized the construction of full-scale production plants for the purpose of building atomic bombs (Fehner and Holl 1995). For security requirements, the project was placed under the Army under the command of Brigadier General Leslie R. Groves. Groves initially presided over a minimal complex consisting of small-scale facilities in Oak Ridge, Tennessee, and the Metallurgical Laboratory (MetLab) facility in Chicago, Illinois. Space and power generation limitations precluded the expansion of the Chicago facility and Groves chose an alternative site near Hanford, Washington, on the Columbia River because of the site's isolation and access to hydroelectric power. The actual design and fabrication of the first atomic bombs took place at the remote Los Alamos Laboratory in New Mexico and was headed by physicist J. Robert Oppenheimer and a host of eminent scientists from across the United States (Groves 1962, Jones 1985). By mid-1945, the \$2 billion Manhattan Project achieved success with a test blast at Alamogordo, New Mexico, and two blasts at Hiroshima and Nagasaki, Japan with a death toll over 125,000. Japan capitulated less than a week later ending World War II.

Several characteristics that were important features of the post-World War II nuclear weapons production policy monopoly were established under the Manhattan Project. First, the entire process was shrouded in secrecy. Because of security concerns, an elaborate system of information control was established which prevented all but a select group of participants from knowing the full dimensions of the nuclear weapons production process.

Second, the number of participants in the policy decision making process was small and limited to select individuals who possessed scientific knowledge or specific policy authority. Third, because of the military nature of the Manhattan Project, the emphasis of the program was on production of materials and weapons. Other possible concerns were secondary to the primary mission of weapons production (Fehner and Holl 1995).

Even before Japan surrendered, planning was underway for the post-war administration and development of atomic power. As early as July 1944, Met Lab scientists had issued a prospectus urging civilian control and the establishment of an international organization to direct atomic research toward peaceful ends. While it was clear that the authority of the Manhattan Project would be transferred, there was a significant debate over the future structure of the new atomic energy authority. In addition, there was considerable debate over whether ultimate authority over nuclear technology would be held by civilian or military officials. Moreover, the Manhattan Project had not produced a stockpile of weapons and U.S. officials believed that a vigorous weapons development and production process would be essential to the nation's future defense needs, particularly given the rapidly cooling relationship with the Soviet Union (Fenner and Holl 1995).

Policy Venue: The Atomic Energy Commission and The Joint Committee on Atomic Energy

What emerged from the political debate over managing nuclear technology was the McMahon Act, named after its sponsor Senator Brien McMahon (D-CT), signed into law by President Harry Truman in August 1946. Officially known as the Atomic Energy Act, the new legislation established the basis for a new public policy which was to develop, use and control atomic energy, "for the public welfare, subject at all times to the paramount

objective of assuring the common defense and security” (PL 585, 60 Stat. 755-75, 42 USC 1801-19). Section two of the Atomic Energy Act created the framework of the institutional structure by establishing the Atomic Energy Commission, consisting of five civilians appointed by the president. The AEA also established a General Advisory Committee to advise the AEC on scientific and technical matters, and a Military Liaison Committee consisting of military representatives from the Pentagon. Finally the Atomic Energy Act created the Joint Committee on Atomic Energy, consisting of nine senators and nine representatives. Together these institutions structured participation in ways which rendered nuclear weapons issues all but inaccessible to outsiders, controlled program information, and ultimately policy outcomes (Allardice and Trapnall 1974, Green and Rosenthal 1963, Hewlett and Duncan 1969).

The Atomic Energy Commission

The 1946 Atomic Energy Act transferred authority over, and ownership of, all atomic technology from the U.S. Army to the new Atomic Energy Commission (AEC). The AEC was designed to be the primary actor in formulating military and civilian nuclear policy. The Commission’s primary duty was to be the development and production of nuclear materials and weapons as defined by Congress. AEC historians concluded that during its early years, the Commission, “exercised its...powers almost in a vacuum. Behind the security barriers the [AEC] lived in a world of [its] own, a world unknown to most of the nation. The President caught only fleeting glimpses of this world, and Congress was almost totally excluded” (Hewlett and Duncan 1969, 449).

From the outset, Congress tried to create an expert commission that would be both insulated from political pressure and closely aligned with the legislative branch. The fixed

tenures of AEC commissioners reflected congressional intent that the AEC be a body relatively independent of the president. Indeed, presidents exercised only indirect control over the AEC during its 30-year history. Lack of presidential support, however, was rarely problematic. On those occasions when political support was necessary, the Commission turned to its ardent ally the Joint Committee on Atomic Energy (Allardice and Trapnell 1974, Green and Rosenthal 1963).

One of the key powers of the AEC was its authority over information about nuclear weapons technology. Control of information was driven by security concerns. Section 10 of the Atomic Energy Act directed the AEC to control the dissemination of restricted data in order to assure the common defense and security. The term “restricted data” covered four expansive areas: (1) information on production of fissionable materials, including all quantitative and qualitative output; (2) information on weapons design and testing; (3) technical data on all military applications; and (4) certain information relating to the operations and facilities of the AEC weapons production program (Allardice and Trapnell 1974). As a practical matter, the vast majority of information about AEC activities was considered restricted data. AEC weapons production operations were essentially shrouded by an elaborate system of procedures, restrictions, and levels of secrecy classification that prevented the vast majority of people from knowing what was going on at the plants well into the 1980s (OTA 1991, U.S. Congress 1989e).

The AEC’s control over information was also maintained through the practice of compartmentalization, or the restriction of knowledge about weapons production to the “compartments” where knowledge was being created. General Groves stated, compartmentalization “was the very heart of security...each man should know everything

about his job and nothing else” (Groves 1962, 140). By parceling production knowledge and information into small, relatively disconnected pieces, few people would ever know the entire picture of the weapons production process. Even within individual facilities, work groups rarely exchanged information about their specific tasks (Gerber 1992, Hilgartner, Bell and O’Connor 1982). Compartmentalization was established during the Manhattan Project period and continued almost intact for nearly four decades and thus served as an extension and reflection of the policymaking process itself (DOE 1989, 1993).

The Atomic Energy Commission’s Powers of Self-Regulation

One of the signal features of weapons production policy administration practiced by the AEC was that it exercised great discretion over the entire process. The Atomic Energy Act of 1946 and subsequent amendments in 1954 and 1959 granted sole authority over all aspects of nuclear weapons production to the AEC. This authority included establishing environmental, safety and health measures for the operations of the weapons production facilities. According to the Atomic Energy Act, the Commission was authorized to “prescribe such regulations and orders as it may deem necessary...to protect health and minimize danger to life and property” (quoted in Dycus 1996, 105). Jurisdiction over the weapons production process, including responsibilities for environmental, health and safety issues, was not shared with other federal agencies. Moreover, state agencies were given no responsibilities over any weapons production-related activities, even as their policy authority was gradually expanding in other areas of environmental protection by the late 1960s (Dycus 1996, Grainey and Dunning 1995, OTA 1991). For its entire history of nearly 30 years, the Atomic Energy Commission possessed sole authority to monitor and control the hazardous byproducts of nuclear weapons production, and ensure

that the production process did not harm the environment, or endanger the health of plant workers or residents living in proximity to weapons production facilities. These powers of self-regulation were to ultimately become the focus of concern for policy reformers.

The driving force behind the establishment and perpetuation of the AEC's power of self-regulation was the concern over security. Historians of the AEC concluded that one of the assumptions underlying the Atomic Energy Act was that placing nuclear weapons production authority under one administrative structure would ease the necessities of security and secrecy, and reduce the possibility that production information could fall into the wrong hands. The legislative history of the Atomic Energy Act reveals little discussion of the environmental, health and safety issues. According to historical materials it appears that the framers of the Atomic Energy Act assumed that the AEC would institutionalize adequate environmental, safety and health measures in the weapons production complex. The major concern was focused primarily on production of materials and weapons rather than on environmental, safety and health matters (Clarfield and Weicek 1984, Dycus 1996, Hewlett and Duncan 1969, OTA 1991).

The AEC's authority over all weapons production-related activities created a situation where there was an absence of independent oversight authority for environmental, safety and health matters. Exercise of this internal authority at the AEC was entirely discretionary. The Commission and its successor agencies responded by drawing broadly defined internal provisions that allowed the most expedient management of waste materials, with little apparent concern for environmental protection or public health consequences (OTA 1991). The powers of self-regulation were reinforced because no opportunity was provided for public notice and comment required by the Administrative Procedure Act of

1946 for agency regulatory decisions and rulemaking processes. For example, when the government decided to expand the size and production capacity of the weapons complex, there were no public hearings about siting, the construction of the plants, or the activities that would be conducted at the sites (Dycus 1996).

Even after the civilian nuclear power program was launched by the 1954 Atomic Energy Act, the AEC's military programs operated under a regulatory structure, and according to a set of operational standards, that was completely closed (National Research Council 1987). While the 1954 AEA created a well-publicized permitting procedure and an ongoing regulatory regime for civilian power reactors, the Commission's military production reactors at Hanford and Savannah River, were not subjected to any regulatory requirements for their operations. Like the entire weapons production process, the regulation of military reactors remained the sole responsibility of the AEC. For example, for over 30 years, military reactors were not subjected to the same safety and radiation containment features as were civilian power reactors. The agency maintained a cloak of secrecy around its defense production reactors, choosing not to publicize operational information, or share that information with other administrative or regulatory entities even when operational activities posed environmental, safety or health concerns (National Research Council 1987, 1989).

The AEC's authority over all aspects of the nuclear weapons production process included the treatment and disposal of hazardous byproducts of production, along with the health and safety of plant workers. Until the late 1960s, few federal environmental, safety, or health regulations existed and none governed radioactive materials or waste byproducts generated by the weapons production process (Mazuzan and Walker 1984). Moreover, the

AEC was often less than straightforward about occupational hazards faced by workers in the weapons plants. The AEC monitored the health of workers and collected health and exposure-related data, but generally did not provide a great deal of information to workers about the substances they were handling, assuming that doing so might unnecessarily compromise the security surrounding the production process. Weapons plant workers were also under strict orders not to share any information about production work, even with family members (Gerber 1992). Moreover, an excessive concern over radiation exposure at the plants might arouse the suspicions of workers, and possibly nearby residents, and create potential challenges to the production mission (U.S. Congress 1989e).

Organizing the Weapons Complex

One of the earliest challenges facing the Atomic Energy Commission was the administrative task of re-organizing and managing the diverse and far-flung resources under its jurisdiction. When it began operations, the AEC had land holdings larger than the state of Rhode Island, administrative, laboratory and production facilities in Washington, Tennessee, Illinois, New Mexico, and Washington D.C., and a workforce of nearly 40,000 in dozens of plants and universities across the nation. The challenge was establishing an administrative organization that could mesh these resources for the purposes of the Atomic Energy Act. The new AEC commissioners decided to set up a headquarters of operations that was informal, flexible, and “free from the incubus of a cumbersome staff” (quoted in Ball 1986, 21). In addition, the AEC made key decisions about managing its far-flung operations that would have long-term implications. The central element of AEC management was decentralization. Under this structure, the Commission would essentially act as a board of directors with field managers given the lion’s share of detailed

administrative controls and authority. Relatively free to negotiate contracts, hire and fire personnel, and determine operational procedures and policies, field managers were given the power to issue their own directives on how AEC weapons production objectives should be met. AEC and Department of Energy historians generally agreed that this arrangement meant that AEC headquarters had little effective line responsibility over this decentralized system. Although the early AEC managerial structure and process was criticized by a number of key entities during 1948-49, it essentially remained in place for nearly four decades (Allardice and Trapnell 1974, Fehner and Holl 1995, Hewlett and Duncan 1969).

The Joint Committee on Atomic Energy

Under the 1946 Atomic Energy Act, Congress also established the Joint Committee on Atomic Energy (JCAE). During its thirty-year history, the JCAE exercised zealous jurisdictional control over both military and non-military applications of nuclear power, served as a guardian of the Atomic Energy Commission, and was uniquely positioned to formulate and oversee nuclear weapons policy. Composed of nine members from both House and Senate, the JCAE was the only joint committee created by statute rather than the parliamentary rules of both chambers of Congress. The Joint Committee exercised extensive policy making powers within the Congress and worked in close quarters with the executive branch like no other congressional committee before it. In the only comprehensive analysis of the JCAE, Green and Rosenthal (1963) claimed that it was one of the most powerful congressional committees in the history of the nation.

The Joint Committee's Institutional Position

One of the important aspects of the Joint Committee's power sprang from its relationship with the Atomic Energy Commission. When the AEC was established in 1946 it had no significant constituency. Unlike most other government agencies, there were no important segments of American society with a special interest in nuclear energy, much less nuclear weapons production, which could have served as sources of support or influence. Most members of Congress demonstrated little interest in nuclear technology issues. Moreover, the commission structure of the AEC ensured a degree of independence from presidential influence. Therefore, the AEC was an almost completely isolated institution in the governmental structure with the exception of the Joint Committee. As a consequence, the AEC was forced to look to the JCAE for support, and this dependence tended to increase the Committee's own stature within the policy making process (Green and Rosenthal 1963). The relationship between the JCAE and the AEC was characterized by Allardice and Trapnell (1974) as "paternalistic," and oriented toward guarding the Commission's work by deflecting real or potential criticism both from within and outside Congress. Furthermore, the JCAE, "always considered the AEC its property, and [has] zealously guarded its legislative territory against invasion by any other committee of either house of Congress" (Allardice and Trapnell 1974, 177).

The JCAE's policymaking position was particularly strong also because of its close relationship with the Executive branch. The Joint Committee tended to involve itself early in the process of formulating legislative proposals emerging from the AEC. The result was that potential conflict was dealt with behind the scenes and diffused early. Moreover, all legislative proposals were fashioned in a consensual atmosphere well

before they reached the full legislative body. Many important policy questions concerning nuclear weapons production and development were effectively decided in closed-door negotiations between the JCAE and executive branch officials rather than through the process of public discussion and congressional debate. More importantly, the vigorous activism of the Joint Committee in the policy formulation process meant that policy outputs bore the unmistakable stamp of the particular interests of the JCAE. The nature of the AEC-JCAE relationship led Green and Rosenthal (1963, 272) to conclude that the effectiveness of the JCAE was based in large part on its “quasi-administrative role” in the policy process.

Finally, the Atomic Energy Act gave the JCAE sweeping jurisdictional powers and the authority to require cooperation from all executive branch agencies. The nature of the policy subject matter and the secrecy surrounding nuclear weapons production policy meant that the Joint Committee was in a position to demand and obtain full access to all information from the AEC and Defense Department on all matters within its jurisdiction. Commenting on the AEC’s mandate to keep the JCAE informed, long-time JCAE member Bourke Hickenlooper said, “every contract, every action of the AEC, is subject to the scrutiny, examination and information of the JCAE...without exception, all such matters are reported to the JCAE prior to final action” (Green and Rosenthal 1963, 91).

Within Congress the Joint Committee enjoyed several distinct advantages that allowed it to maintain a monopoly on nuclear weapons policy during its entire history. Chief among those advantages was the JCAE’s total jurisdictional control on all nuclear policy matters. As Green and Rosenthal (1963, 266) remarked, “within Congress, the Joint Committee *is* the Congress on nuclear issues.” Similarly, AEC historians

concluded, “except for the Joint Committee, the nation’s elected representatives know little more about atomic energy than the people themselves” (Hewlett and Duncan 1969, 561). The JCAE’s exclusive access to nuclear information gave the Committee an overwhelming advantage in policy debates that other members of Congress lacked. Because of the informational advantages enjoyed by members of the JCAE, there was an inclination for members of Congress to rely exclusively on the judgement of the JCAE on nuclear weapons production matters. Moreover, the tendency of Congress to defer to specialized committees was reinforced because nuclear energy was essentially a national security matter. In practice, the JCAE controlled debate by issuing identical reports to both House and Senate on pending legislation. This practice acted to present a consensus opinion of the Committee and further restrict the policy debate by presenting the full Congress with a single bill. Moreover, the presence of consensus within the Joint Committee over a policy question acted to cue the full Congress to follow the panel’s lead on a policy proposal (Green and Rosenthal 1963).

JCAE Membership

Although the members of the JCAE were not nuclear weapons technical experts (many did have defense-related backgrounds) they quickly assumed and maintained a degree of policy expertise which was respected by their congressional colleagues. One of the key reasons for the development of this policy expertise was that nuclear weapons production information was not shared with other members of Congress. The information control process exercised by the Joint Committee placed strict barriers around the development of expertise across the entire congressional body. JCAE members exhibited few qualms about protecting their jurisdictional domain by

communicating the idea that their access to information, coupled with a close relationship with key players in the executive branch, gave the Joint Committee exclusive control over nuclear weapons production policy making. Again, the control over information served as a barrier against outside interference in nuclear weapons policy matters (Allardice and Trapnall 1974).

The stability of the JCAE's membership was also a significant factor in its role in the nuclear weapons production policy monopoly. During its 30-year existence, an average of 66 percent of JCAE members were from states where nuclear weapons production facilities and laboratories were located thus providing electoral benefits to members who could provide tangible economic gains to their constituents (Duffy 1997). Stability of JCAE membership was also important. A core group of six individuals served for 20 years or more on the JCAE, four served for 16 years, and four others enjoyed tenures of 14 years (Allardice and Trapnell 1974, CQ Index 1977). Moreover, the chairmen of the JCAE exercised a great deal of influence in the committee assignment process and tended to exclude members of Congress who demonstrated an "undue interest in [the JCAE's] excessive executive session proceedings" or who "unnecessarily questioned" the Committee's policy prerogatives (Allardice and Trapnell 1974, 124). In their seminal study of the JCAE, Green and Rosenthal (1963) concluded that the Committee was in fact "functionally independent, although it was structurally an integral part of Congress" (1963, 272).

The General Advisory Committee and the Military Liaison Committee

The 1946 Atomic Energy Act produced two additional institutional components of the nuclear weapons production policy monopoly. The General Advisory Committee (GAC) to the Atomic Energy Commission was a nine-member, presidentially appointed board designed to oversee nuclear weapons development progress at AEC facilities and provide advice to AEC on all nuclear policy matters. According to Richard Sylves' history of the GAC, the body critically analyzed and produced policy recommendations in every area of AEC responsibility, and served as the central advisory body regarding nuclear weapons development (Sylves 1987). Because many members of the Atomic Energy Commission were policy generalists, the GAC essentially served as the repository of scientific and technical knowledge regarding nuclear weapons development issues, particularly during the majority of the AEC's history. The GAC membership roster included such luminaries as J. Robert Oppenheimer, Enrico Fermi, Edward Teller and Glenn Seaborg. As a result of the scientific abilities of the GAC, the AEC was inclined to defer important policy decisions to the more scientifically experienced and prestigious members of the Committee. While the specific degree of influence of the GAC in AEC policy decision making is difficult to pinpoint, there was a "close association between AEC and GAC members" (Sylves 1987, 19).

Nor was the GAC's influence strictly limited to the Atomic Energy Commission. The Joint Committee on Atomic Energy regularly consulted GAC members because of a lack of technical expertise by members of the congressional body (Sylves 1987). During its 30-year existence, members of the GAC were frequent visitors to the JCAE hearings and closed discussions. Moreover, members of the JCAE often sought out individual

representatives of the GAC for their advise and support for nuclear weapons technology. Gaining the support of members of the GAC was often a useful means of persuading the AEC, or Congress itself, of the JCAE's policy goals (Green and Rosenthal 1963). The scientific and technical backing of the GAC was essential for nearly all of the key nuclear weapons decisions (Sylves 1987). The GAC itself often asked top-level political and military officials to participate in policy development meetings. These officials often included members of the Joint Chiefs of Staff and other Defense Department officials who were responsible for national security policy, including nuclear weapons matters (Clarfield and Weicek 1984).

A second support institution created by the Atomic Energy Act of 1946 was the six member Military Liaison Committee (MLC) to the Atomic Energy Commission. The MLC was composed of Defense Department officials and wielded considerable influence in the area of nuclear weapons production and development. The chief responsibility of the MLC was to present the military's nuclear weapons and materials needs to the AEC. According to the Atomic Energy Act, the MLC would have the task of "advising the AEC on all atomic energy matters which [the MLC] deems to relate to military applications, including the development, manufacture, use and storage of atomic bombs" (Ball 1986, 21). The MLC's influence also derived from the fact that the AEC itself was not responsible for determining the military needs of the national security, nor was the Commission the primary receptor of key intelligence data. In fact the Defense Department retained all intelligence functions related to nuclear weapons. The MLC essentially served as the mouthpiece for the armed services in AEC decisions regarding nuclear weapons. The key decisions regarding technological developments for strategic

and tactical nuclear weapons were communicated to the AEC from the MLC (Clarfield and Weicek 1984).

The Atomic Energy Commission and its Weapons Complex Contractors

Another key component of the institutional structure of the nuclear weapons policy monopoly was the private sector contractors who operated the production facilities. From the outset of the Manhattan Project in 1942, the government was heavily reliant upon the expertise of private contractors in developing nuclear weapons technology. The Federal bureaucracy possessed neither the technical expertise nor the manufacturing capacity to build nuclear weapons and came to rely on private sector organizations for all major aspects of nuclear weapons development and production (Kettl 1993).

The weapons facilities themselves were government owned, but contractor operated (GOCOs). The term "GOCOs" referred not simply to the owner-operator relationship, but was also an expression of a deeper philosophical relationship between the Federal government and its weapons complex contractors (Kettl 1993). In the simplest of terms, the GOCO relationship was characterized as one operating according to a "philosophy of least interference" wherein the AEC often deferred to contractor decision making in the technical and operational aspects of weapons production. The rationale for this approach to oversight was to allow contractors freedom to pursue weapons design and process development with a minimum of interference. The operating attitude emerged primarily because the contractors possessed the technical expertise, were trusted to fulfill their contractual obligations, and because the AEC did not have the organizational resources to engage in effective oversight. Oversight was apparently de-emphasized because contractors were extremely successful in meeting materials and weapons production goals and deadlines. As

long as there was little incentive or ability for the AEC to closely monitor the production processes used throughout the complex, contractors were able to conduct their duties with virtual autonomy (Kettl 1993, U.S. Congress 1993, U.S. GAO 1991a).

The philosophy of least interference was not merely an attitude; it was an institutionalized practice that prevented the AEC and DOE from developing effective information and communication systems to monitor their contractor's performance in areas other than materials and weapons productivity (U.S. GAO 1992b). The language of government-contractor agreements themselves gave wide discretion to contractors meaning that they faced minimal direct control and supervision by the AEC and its successor agencies. The incentive system of the contracts was heavily weighted toward meeting material and weapons production goals, but placed virtually no emphasis on environmental performance (U.S. Congress 1993). This incentive structure, which operated for 40 years, would be a major factor in producing negative environmental, safety and health consequences.

By the late 1940s, an institutional structure had emerged and was charged with a set of responsibilities over the development of nuclear technology. The Atomic Energy Commission, the Joint Committee on Atomic Energy, and the two key nuclear weapons advisory bodies were the central policy making institutions for nuclear weapons production policy. These institutions were important components of a national security apparatus that Daniel Yergin (1978) described as a "state within a state." The institutions responsible for nuclear weapons production policy were key components of an extraordinarily powerful policy subsystem. The AEC and the JCAE exercised complete jurisdiction over the weapons production process and instituted rigorous controls over

information about nuclear weapons policy. Policy debates and decisions made by these institutions were rarely public and both the ACE and JACE made decisions in a consensus-oriented atmosphere. By virtue of its statutory powers, the Atomic Energy Commission was an island of self-regulation concerning nuclear weapons production activities.

Finally, secrecy and security served as key institutional components of nuclear weapons production policy. They made major contributions to the policy monopoly and quickly became institutionalized not merely in the activities of the major policy actors, but in the overall administration and conduct of policy itself. Secrecy and security were such powerful institutions that they outlasted both the Atomic Energy Commission and the Joint Committee on Atomic Energy. Perhaps most importantly, and central to the creation and maintenance of the weapons production policy monopoly, was the set of ideas and images that established and naturally flowed from the institutional structure. It is to these ideas and images that we now turn.

Nurturing a Positive Image: National Security and the National Interest

Baumgartner and Jones (1993) argue that the policy image is coupled with the policy venue. Image is a critical component of a policy monopoly because a positive image, or set of images, are important for creating and sustaining support for a policy. Those individuals, groups, or institutions that constitute the policy venue have a strong interest in fashioning and communicating a positive image because it legitimizes their institutional position and the policy itself. Often, the positive image is communicated in rhetorical terms that can appeal to a wide audience as well as deflect any real or potential opposition.

Controlling the positive image then is a critical task of the participants in a policy monopoly.

The following sections will examine the policy images that were important for the creation and maintenance of the nuclear weapons production policy monopoly, as well as how these images were communicated. The images surrounding and supporting nuclear weapons production can be examined on two related levels. First is the policy level, or the functional role of nuclear weapons, and weapons production, as tools of national policy. From this perspective, nuclear weapons were vital components of post-Second World War military and foreign policy and equated with the national interest and buttressed by notions of patriotism and loyalty. The urgency of the Cold War competition with the Soviet Union was a central force in images at the policy level. A second set of images is found at the operational level where images were specifically related to activities surrounding the physical process of weapons production. Also at the operational level, was a set of images focusing on the economic benefits of nuclear weapons production activities, particularly for the communities surrounding the weapons plants.

Policy Level Images: National Security and the Weapons Production Imperative

The central image that supported the policy monopoly was that nuclear weapons quickly assumed a central role in post-World War II U.S. defense and foreign policy. Japan's quick surrender after Hiroshima and Nagasaki appeared to confirm the military utility of atomic weapons. In addition, the deterrent capabilities of nuclear weapons were demonstrated during Cold War confrontations over Berlin, Korea, Taiwan, and Cuba, or so U.S. civilian and military leaders believed. The U.S. quickly became involved in an arms race with the Soviet Union, prompted by the Soviet's atomic test in 1949, its

thermonuclear test in 1954, and perceived bomber and missile gaps during the 1950s. Moreover, U.S. defense and foreign policy makers perceived themselves as confronting an aggressive and highly motivated Soviet Union bent on world domination. U.S. policy makers believed that only by developing superior numbers of nuclear weapons could the threat posed by Soviet communism be deterred. The result was the emergence of an entirely new conceptualization of defense and foreign policy where U.S. interests were of a global dimension and threatened by an ideologically driven adversary armed with weapons of mass destruction. The product of this new perception was a notion of national security underpinned by nuclear weapons (Freedman 1981, Herkin 1985).

As a result of their perceived military and diplomatic utility, nuclear weapons quickly assumed a central place in U.S. strategic thinking and they were developed for nearly every conceivable military purpose (Herken 1985). By the end of the 1950s strategic nuclear weapons were based in a triad of land, sea, and air forces. War planners were using concepts such as “massive retaliation,” “escalation dominance,” and “counterforce” each denoting a strategy which emphasized the role of strategic nuclear weapons. U.S. strategic planners had targeted nearly every military and economic asset in the Soviet Union, Eastern Europe and China for destruction in the event of war. Due in part to Pentagon rivalries, tactical nuclear weapons were developed for every conceivable battlefield use and were seen as a tool which would offset Soviet numerical advantages in overseas military theaters (Herken 1985). While there were a handful of cautionary voices about placing such a heavy emphasis on nuclear weapons for defense, the prevailing idea during the time was, “expansion of [weapons] production would be in the interest of national security; anything less would squander a priceless asset for defense”

(Hewlett and Duncan 1969, 557). The result was that as the military needs of the defense establishment expanded, greater nuclear weapons production capacity was necessary. As indicated in Table 4-1, the size of the nuclear weapons arsenal underwent a massive expansion after modest beginnings.

Table 4-1: Number of Nuclear Weapons in the U.S. Arsenal, 1945-1970

1945 - 6	1960 - 20,434
1948 - 110	1962 - 27,305
1950 - 369	1964 - 30,400
1952 - 1,005	1966 - 31,323
1954 - 2,063	1968 - 28,507
1956 - 4,816	1970 - 25,742
1958 - 9,822	

Source: Natural Resources Defense Council (www.nrdc.org)

The result of the institutionalization of nuclear weapons into the U.S. defense establishment was a “production imperative” where the need for nuclear materials and weapons expanded at a rapid pace from the late 1940s through the 1960s. One of the consequences of the “production imperative” included an expansion in the overall scope and operations of the complex. Between 1947 and 1952 the Atomic Energy Commission initiated an expansion of the nuclear weapons infrastructure that greatly increased its weapons production capacity. The expansion included additions to the Oak Ridge facility and new facilities at Paducah, Kentucky, and Portsmouth, Ohio. Five new production reactors were built at the Savannah River Site near Aiken, South Carolina. Five additional production reactors were built at the Hanford Reservation. Finally, a reactor research and testing facility was established near Idaho Falls, Idaho (Fehner and Holl 1995). The complex expansion also included auxiliary facilities designed to strengthen various aspects of the production process. These included a uranium processing and

enrichment facility at Fernald, Ohio, a plutonium fabrication and machining facility at Rocky Flats, Colorado, and an assembly plant in Amarillo, Texas. In addition, weapons testing facilities were set up in the Marshall Islands in the Pacific and in the Nevada desert (Fehner and Holl 1995).

In many ways the Joint Committee on Atomic Energy was the most enthusiastic proponent of the wave of enthusiasm over nuclear weapons, and served as the primary force in stimulating the production imperative. According to Green and Rosenthal (1963) the JCAE possessed unambiguous objectives for nuclear military applications and achieved those objectives, “by surveillance of the atomic energy establishment, constant pressure on the Executive branch and determined bargaining” (Green and Rosenthal 1963, 233). Central to the JCAE’s enthusiasm was a consensus over the military utility of nuclear weapons, coupled with a generally negative perception of the Soviet Union. Senator Brien McMahon, the first chairman of the JCAE expounded the idea that nuclear weapons should be “the keystone of our military policy and a foundation of our foreign policy as well” (Udall 1994, 135). Further, McMahon articulated the emerging image of the utility of nuclear weapons, “I...propose that we now set about the business of building up atomic bone and muscle and cutting away what will become excess military fat. Specifically I propose that we make our best and cheapest weapon [nuclear weapons] the backbone of our peace power” (Green and Rosenthal 1963, 236).

The Joint Committee was successful in three key areas of military applications of nuclear power and thus made a significant contributed to the production imperative. The JCAE served as a key basis of support for the decision to develop the hydrogen bomb in late 1950, even as the AEC and the GAC wavered in their support for the project

(Clarfield and Weicek 1984). The JCAE was also a driving force in maximizing the role of nuclear weapons in the U.S. military force posture, to an extent greater even than the Pentagon. As such the JCAE took the initiative in compelling the AEC to develop tactical nuclear weapons for a wide variety of battlefield uses. Finally, the JCAE was a vigorous proponent of constantly expanding plutonium production. The Committee consistently added items to AEC budget requests, and often pushed harder for increases in plutonium production than did Pentagon officials (Green and Rosenthal 1963). In these respects, the JCAE was a key feature in the development and perpetuation of the production imperative that dominated weapons production policy making through the 1960s.

Consequences of the Production Imperative

While the production imperative enabled the U.S. defense posture to integrate thousands of nuclear weapons into its arsenal, the effort to produce the weapons came at a price. The heavy emphasis on weapons production meant that other concerns, particularly environmental, safety and health concerns received significantly less attention (DOE 1989, 1996). In his recollection of the Manhattan Project, General Leslie R. Groves hinted at the negative consequences associated with the production imperative, “Not until later would it be recognized that chances would have to be taken that in more normal times would be considered reckless in the extreme. Work proceeded vigorously on major phases of the project despite large gaps in basic knowledge...while normally haste makes waste, in this case haste was essential” (Groves 1962, II).

As declassified AEC and DOE documents would later indicate, haste did make waste across the entire weapons production complex. The production process created

enormous radioactive and hazardous wastes at all weapons production facilities. The process spewed tons of contaminants into the air, soil and water around weapons production plants. Local environments were contaminated, sometimes severely, and the health and well-being of nuclear weapons workers and citizens living in proximity to the plants was threatened. Given the security concerns, virtually none of this information was known by the public. The AEC, in concert with its weapons complex contractors, released only scant general information about production activities. It would only be years later that the full scale of contamination at the weapons complex would be revealed (OTA 1991). Very little of this information, however, would reach the public until the 1980s.

The problems associated with hazardous byproducts of nuclear weapons production, coupled with the production imperative, were recognized early in the weapons production process. In an April 1948 report to the AEC, the Commission's Safety and Industrial Health Advisory Board recognized the hazardous nature of nuclear weapons production, as well as articulating the potential public policy problems associated with the production imperative,

“[The] AEC is now entering a phase in which their operations...will soon be public property and they will be accountable to public health, a very severe critic. In the haste to produce atomic bombs during the war certain risks may have been taken in research, production, testing, transportation and waste disposal with the understanding that subsequently more effective control measures would ameliorate these risks and lessen the hazardous conditions formerly created...the disposal of contaminated waste in present quantities and by present methods (in tanks or burial grounds or at sea), if continued for decades, presents the gravest of problems” (quoted in DOE 1996, 8).

The problem of managing the hazardous byproducts of nuclear weapons production was an important issue for the AEC, but it was an issue that suffered neglect primarily because of the production imperative. Waste management was consistently an issue “to be addressed” in the future. Even as the weapons needs of the Cold War expanded, waste management did not receive concerted attention for over two decades despite the increasingly complex technical and political dimensions of the issue (Carter 1987). Moreover, the secrecy surrounding weapons production created a vacuum of information and knowledge for developing adequate engineering measures to alleviate the gradually growing contamination problems across the complex (Werner 1993). As Clarfield and Weicek argued, “the military emphasis...imposed on America’s nuclear program virtually excluded any serious attention to nonmilitary applications” (1984, 125). The emphasis on military applications was not merely to the detriment of civilian-oriented power programs, but also precluded adequate resources devoted to waste management programs. As later government reports indicated, resources devoted to non-production activities, including waste management, might have created problems in meeting the burgeoning needs of the U.S. defense establishment during the Cold War (DOE, 1989, Gerber 1992, OTA 1991).

The National Interest and a Sense of Mission

Another key aspect of policy level images that infused the institutional venues of nuclear weapons production policy was a “sense of mission.” The sense of mission exhibited in the institutional apparatus was a component of the wave of enthusiasm commonly found in the creation and maintenance of policy monopolies (Baumgartner and Jones 1993). Indeed, the Atomic Energy Act which produced the AEC and the JCAE

established the organic mission for these institutions as “making the maximum contribution to the common defense and security” (DOE 1991, 9). Coupled with the organic directive of mission, was a perception by members of the AEC and JCAE that theirs was no ordinary duty. Histories of the AEC and JCAE clearly indicate that the members of these institutions were well aware of their responsibilities associated with the development of nuclear weapons technology and would use this rhetoric in policy discussions. Green and Rosenthal (1963, 272) described the collective members of the JCAE as possessing a “positive sense of mission” in its approach to nuclear weapons policy making generally and a “sense of unity” with regard to national security matters in particular.

The sense of mission exhibited by the members of the AEC and JCAE contributed to a remarkable degree of consensus in policy formulation and decision making. Out of a desire to avoid the possibility of sending mixed signals about such an important national security issue as nuclear weapons development and production, the AEC and the JCAE demonstrated a remarkable degree of unanimity in their policy decisions. Lewis Strauss, AEC member at the founding, and chairman during the 1950s, recalled that the vast majority of the Commission’s policy decisions were unanimous. According to Strauss, in its first three years of operations the AEC rendered over 500 decisions, only twelve of which were split votes. Of the over 1,500 votes held by the AEC from 1953-58, less than 100 were split (Strauss 1962). Although a comparable measure of JCAE voting is not available, Green and Rosenthal (1963) refer to a consistent spirit of bipartisanship among the members of the Joint Committee regarding its policy jurisdiction. The spirit of defense policy unanimity was not unique to the JCAE, however. Until the Vietnam War, foreign and defense policy was characterized by a sense of bipartisanship where members of

Congress generally practiced the idea that partisan disagreements ended at the water's edge (Herken 1985).

Perhaps as important, whatever disagreements might have existed in AEC or JCAE policy decisions were not part of the public record. Because of security concerns, policy debate and the decisional process, were conducted behind closed doors and usually in executive session. There was little, if any, public display of either the content or the conduct of decisions regarding nuclear weapons production policy. Members of the two bodies were inclined to present a united front so as to avoid clashing over vital national security issues (Green and Rosenthal 1963, Hewlett and Duncan 1969).

Nuclear Weapons and the National Interest: Patriotism and Loyalty

The sense of mission exhibited by the Atomic Energy Commission and the Joint Committee on Atomic Energy was symptomatic of a larger image that prevailed during the Cold War era and insulated nuclear weapons production policy. Many analyses of the two decades following World War II clearly indicate a general perception that the development of nuclear technology, particularly weapons development, was equated with the national interest (Trainer and Kaku 1982, Wasserman and Soloman 1982). For example, in a 1951 study of the debate over civilian versus military control of nuclear technology development, Robert Dahl and Ralph Brown equated the program with an overriding national interest. The authors concluded that any criticism of the program "appear to many as an almost unpatriotic attempt to play politics at the expense of national security" (Duffy 1997, 28). Perhaps unlike other public issues, dissent of the kind that would raise questions about the wisdom or morality of a public policy was simply not tolerated when it came to the connection between nuclear weapons and national

security. At least through the 1960s, nuclear weapons were generally perceived as vital components of the defense apparatus and their production and development was assumed to be a necessary activity.

Ironically, the positive image of nuclear weapons for national security purposes also had a negative side. This negative side is perhaps best expressed in one simple term: McCarthyism. The anti-communist rhetoric espoused by Senator Joseph McCarthy and his allies was to create a chilling effect on dissent among top-level defense and foreign policy makers. Charges of being soft on communism wrecked many political careers, while red-baiting propelled many officials, including Richard Nixon, from obscurity to national prominence. The notorious hearings of the House Committee on Un-American Affairs during the late 1940s and early 1950s provided a stage for accusers to recite the now notorious question “are you now, or have you ever been a member of the communist party?” Invoking the Fifth Amendment was often tantamount to a confession of questionable associations and, worse, disloyalty. The anti-communist crusade of the Cold War years had its own set of images that consisted of expectations of loyalty and support for defense and foreign policy programs. Opinions that ran against these images often came under attack (Rhodes 1995, Yergin 1978, York 1987).

The effort to root out disloyalty knew no bounds. In the aftermath of the nuclear espionage cases of Alger Hiss, Klaus Fuchs, and the Rosenbergs, the “father of the atom bomb” Robert Oppenheimer came under attack. Oppenheimer was targeted not necessarily because he represented a security threat, but because of his dissent on key nuclear weapons development decisions (Rhodes 1995). In particular, he opposed the 1950 decision to build the hydrogen bomb. At the time, Oppenheimer headed the General Advisory Committee

and based his opposition to build the “super bomb” on moral grounds arguing that its enormous destructive potential threatened to usher in an era where the mass extermination of civilian populations would be an acceptable military contingency. According to the classified GAC report given to President Truman, Oppenheimer and five of his colleagues underscored the moral nature of the decision to build the hydrogen bomb, and succinctly stated what would later become a key idea in undermining the nuclear weapons production policy monopoly. The group stated that the hydrogen bomb “is in a totally different category from an atomic bomb...its use would involve a decision to slaughter a vast number of civilians. We are alarmed as to the possible global effects of the radioactivity generated by the explosion of a few super bombs of conceivable magnitude...therefore, a super bomb might become a weapon of genocide” (quoted in Rhodes 1995, 155). The GAC report was classified and President Truman quickly approved the development of the hydrogen bomb in January 1950 with no further discussion of its moral implications as outlined by Oppenheimer. The decision to develop the hydrogen bomb was one driven primarily by the urgency of the Cold War. Issues concerning the morality of developing such a powerful weapon paled in comparison to the needs of the national security (Rhodes 1995).

Although Oppenheimer was exonerated in 1964 when he was awarded the Fermi Prize, his experience was merely the most public effort aimed at controlling information about nuclear technology under the guise of security, and using the security issue to suppress possible dissent about nuclear weapons policy more generally (Rhodes 1995, Stern 1969). Sylves (1987), for example, suggested that Oppenheimer’s ordeal may have made members of the General Advisory Committee “wary of offering opinions [to the AEC or JCAE] that may have been considered disloyal or obstructive” (Sylves 1987,

187). Sylves (1987) went on to argue that the political context of the Cold War created a climate in which government officials could not comfortably advocate or propose unilateral restrictions on nuclear weapons testing or production, for example. In fact, individuals who advocated testing cessation or major restrictions were simply not considered for membership on the GAC.

Local Level Images: Patriotism and Economics

The policy level images of nuclear weapons production also had a local level dimension. Although specific details about the exact nature of the work undertaken at nuclear weapons facilities was rarely mentioned, plant workers and residents in local communities knew that the work was associated with national defense. As such there was a pervasive attitude of patriotism that the work was being done in the name of national security particularly during the Cold War years (Gerber 1992). Local support was often expressed in symbolic ways. For example, Richland High School near the Hanford Reservation chose to include an emblem of a mushroom cloud in its school emblem (Gerber 1992). When the AEC announced its selection of the Rocky Flats site outside Denver in 1951, the local response was enthusiastic. One *Denver Post* headline read, "There's Good News Today," in announcing the AEC decision to build the \$45 million Rocky Flats facility. Leading political and community business people expressed pride in the AEC decision. State and local officials quoted in the *Rocky Mountain News* said, "We are proud that the area has been chosen for another important contribution to the nation's strength and future security" (Buffer 1998). Local pride was so great that on March 23, 1966 Colorado Governor John Love signed a proclamation for "Rocky Flats Day." The proclamation commended the plant for "its stability of employment, its

contributions to the economic health of Colorado, its leadership in industry, and its importance to the defense of the United States” (Buffer 1998).

Nuclear weapons production policy also contained an important local economic dimension. The nuclear weapons production complex was vast, with thirteen major sites and dozens of smaller sites scattered across the country. Particularly during the boom days of the 1950s and 1960s nuclear weapons production employed thousands of people nationwide. At the peak of its operations, for example, the Hanford Reservation employed over 12,000 people. The nearby city of Richland was described as resembling a company town where the industry essentially fueled the entire regional economy (Gerber 1992).

Although modest in size by comparison, both Fernald and Rocky Flats were also important sources of local employment. Although the numbers often fluctuated, Fernald’s uranium processing operations employed nearly 2,000 people during the 1960s and always employed at least 1,000 during its operational years (DOE 1998). The Rocky Flats plant near Denver employed over 3,500 people by the end of the 1960s and the AEC was among the top five employers in Colorado during the decade (Buffer 1998). Moreover, local communities benefited from the weapons production facilities by servicing the various economic needs of the plant workers. Although the unionized plant workers were on the front line of health and safety concerns, they were also strong, if silent, supporters of the nuclear weapons production process at least during the first three decades of operations.

Operational Level Images: Safety, Secrecy and Trust

The images surrounding nuclear weapons production policy can also be examined at the operational level, where the actual physical activities associated with production occurred. Operational images were composed of two general features. One component was

secrecy. As was illustrated above, the vast majority of AEC weapons production-related information was classified as secret and thus unavailable to the public. The other component of operational images was that AEC weapons production activities were being conducted in a safe manner. These images were communicated in a way that placed an emphasis on building public trust not only in the technology, but also in the institutions responsible for its management. At the heart of the image of public trust was the idea that the institutions responsible for nuclear weapons technology were competently managing the new technology and were doing so in a manner which was safe and in the interest of the public good (DOE 1993).

Although the vast majority of AEC nuclear weapons activities were hidden behind a veil of secrecy, the Commission nevertheless maintained a vigorous public relations program concerning its operations. Despite security concerns, the Commission developed a regular communication link in order to reassure the public about nuclear weapons-related issues. Regardless of the activity under the AEC's administration, nuclear weapons production, weapons testing, or civilian power production and reactor safety, the public relations campaign maintained a consistent message that AEC operations were being conducted well within established and accepted health and safety parameters (Hilgartner et al. 1982, Wasserman and Soloman 1982).

A vital component of the safety image was an understanding of the hazards associated with radiation exposure. Since the earliest medical analyses of people who worked with radioactive substances, exposure to radioactivity was known to produce debilitating injuries and death. Early studies assumed that because the effects of radiation were rarely immediate, danger due to exposure was fairly low. By the late 1940s, however,

medical analysis acknowledged that exposure to radiation caused cancer. The key point of debate centered on how much radiation exposure was considered safe. The prevailing scientific viewpoint at the time of the creation of the nuclear weapons production policy monopoly was that there existed a safe threshold of exposure below which radiation caused no harm (Wasserman and Solomon 1982).

When the Atomic Energy Commission was established in 1946, its Division of Biology and Medicine, which set safety and health standards for the Commission, accepted the threshold dose theory and established radiation exposure policy accordingly (DOE 1998). Although there was a gradual reduction of the radiation exposure standard through the 1950s and 1960s, the threshold dose theory continued to guide AEC nuclear weapons production operations. Because the AEC was considered the expert agency concerning nuclear technology, and all radiation exposure-related health and safety authority was vested in the agency, the Commission was able to establish safety standards without extensive external review (National Academy of Sciences 1987). The incentive for the Commission was to maintain, even bolster, the threshold dose theory. To accept the possibility that even low doses of radiation exposure could cause harm might create serious obstacles to weapons production and provide justification to those few critics who believed health-related issues at nuclear weapons plants should be under the authority of the U.S. Public Health Service, rather than the Atomic Energy Commission (U.S. Congress 1957, Wasserman and Solomon 1982).

Radiation exposure had emerged as a controversial issue during the 1950s when the AEC was testing nuclear weapons at the Nevada Test Site. A handful of articles had emerged which attempted to tie increased radiation exposure to higher cancer and mortality

rates in different groups worldwide. The controversy stimulated enough controversy to prompt a series of congressional hearings in 1957. The hearings focused on the testing controversy and examined the available evidence about the health effects of radioactive fallout. Although the AEC claimed that available evidence was insufficient to make any solid determinations, the Commission was directed to expand its analytical efforts to develop a better understanding of the radiation controversy (DOE 1996). Part of the AEC and Joint Committee's motivation to study the radioactive exposure issue was to rebut critics by providing conclusive evidence of a threshold dose and provide support for the Commission's risk assessment procedures (DOE 1996). Although a research effort was put in place, it was conducted entirely by AEC scientists, or by scientists under contract to the AEC. While conclusions were neither quickly forthcoming, nor solid, the public controversy died down in the aftermath of the 1963 Test Ban Treaty that, for the most part, ended atmospheric testing of nuclear weapons.

The Veil of Secrecy

Alongside the public relations effort of the Atomic Energy Commission was its authority to maintain a veil of secrecy around its weapons production operations. Because almost all information about the nuclear weapons production program was deemed as restricted or classified data, other federal agencies, states, municipalities, workers, and citizens living near weapons facilities had few opportunities to discover or respond to potential or real health and environmental threats posed by weapons production. Far from a desire to protect vital production secrets, AEC officials did not want to frighten workers and local residents about the true nature of health and safety hazards associated with nuclear

weapons production. Doing so might unnecessarily arouse opposition and threaten the weapons production mission (Gerber 1992). The drawback to secretive operations, however, was that vital health and safety information was often hidden from those most vulnerable to the hazards of nuclear weapons production: plant workers and citizens living in nearby communities.

The AEC wielded exclusive authority to maintain a shroud of secrecy around the weapons production process through an extensive information classification program. According to a 1995 report by the Advisory Committee on Human Radiation Experiments, the AEC's power to classify information went well beyond concerns over production information to include potential embarrassment of the AEC and its weapons complex contractors. The definition of "confidential information," for example, included:

[d]ocuments, information or material, the unauthorized disclosure of which, while not endangering the National security, would be prejudicial to the interests or prestige of the Nation or any Governmental activity, or individual, or would cause administrative embarrassment, or be of advantage to a foreign nation shall be classified CONFIDENTIAL (ACHRE 1995).

Furthermore, the ability to maintain a veil of secrecy around weapons production operations extended to information about potential or real health risks that radiation exposure posed for workers and the public. Therefore, the definition of classified information also included:

[p]apers referring to levels of soil and water contamination surrounding Atomic Energy Commission installations, idle speculation on future genetic effects of radiation and papers dealing with potential process hazards to employees are definitely prejudicial to the best interests of the government. Every such release is reflected in an increase in insurance claims, increased difficulty in labor relations and adverse public sentiment (ACHRE 1995).

In every respect, the AEC utilized its authority to shroud its weapons production processes from public view. At the same time, however, the Commission generated an extensive public relations effort designed to create an atmosphere where potentially concerned people would be reassured that the risks of working with or living near radiation were minimal. In fact, risks were potentially serious, but never adequately communicated to those who were most vulnerable, plant workers and citizens living in proximity to the production sites. The AEC was reluctant to acknowledge any risk associated with nuclear weapons production choosing instead to reassure rather than inform (Gerber 1992, OTA 1991, U.S. Congress 1989e). The AEC's reluctance to provide potentially vital information to workers and citizens was to undermine the Commission's credibility as evidence emerged during the late 1960s and early 1970s that nuclear weapons production operations posed potentially serious hazardous to public health and the environment (Metzger 1973).

In sum, the set of positive images associated with nuclear weapons production policy was complex and existed on two related levels. Images at the policy and operational levels were crafted to cultivate both direct and indirect support for nuclear weapons production policy. Although the membership of the nuclear weapons production policy monopoly was fairly small, those involved were able to surround their policy with a set of images that presented serious barriers to public debate and argumentation. It was difficult to argue against the military role of nuclear weapons due to the combination of national security and the Cold War conflict with the Soviet Union. The scattered opposition was often branded as uninformed, unscientific, or unAmerican. Those who were concerned with the potential health and environmental concerns were

hampered by the official secrecy surrounding weapons-related activities. The following section will examine how the package of positive images began to come under attack by the end of the 1960s. Opposition was scattered and generally random. Moreover, opposition to these positive images came from a disparate set of sources that began to question nuclear weapons production policy at both policy and operational levels.

Cracks in the Monopoly: Early Opposition and the Development of Negative Images

The punctuated equilibrium model posits that the impetus for policy change occurs when new ideas become part of institutional agendas (Baumgartner and Jones 1993). New ideas are important for policy change because they are often presented in ways that challenge assumptions about prevailing policy ideas and provide suggestions about better policy. Proponents of policy reform attempt to place new ideas on political agendas in order to initiate policy change. Moreover, reform proponents attempt to present new ideas in ways that cast a negative light on prevailing policy ideas, and their accompanying images, as a means of stimulating policy change. The important battle then is over the images that surround a given policy. Members of policy monopolies have an incentive to fashion, maintain, and even manipulate an image that supports the prevailing policy, while reform proponents have an incentive to present ideas that challenge prevailing images and suggest alternatives.

The following sections will examine the emergence of opposition to the nuclear weapons production policy monopoly. This opposition came from both inside and outside the policy monopoly and was related by virtue of a concern over threats to public health and the environment. Although widespread opposition to nuclear weapons production policy did not fully blossom until the early 1980s, the foundation of that

opposition was well developed by the end of the 1960s. In particular, the battle over ideas and policy images was well under way by 1970. Specific concerns over the hazardous nature of nuclear weapons production had emerged on a small-scale basis only, and were focused at a small number of locations in the country.

The Institutional Structure: External and Internal Criticism

By the late 1960s, the institutional structure of the weapons production policy monopoly, which had seemed all but impregnable, was under attack. The point of conflict was not necessarily over weapons production issues at the Atomic Energy Commission, but rather the manner in which the Commission had administered nuclear technology more generally. By 1970, the AEC was under increasing criticism of its management of its nuclear power programs. The AEC's dual mission of both promoting nuclear power development as well as regulating the new technology had begun to raise doubts among some that a real conflict of interest was at work in AEC policy making (Temples 1980). In addition, the AEC had come under fire for its poor handling of nuclear reactor safety issues, which had begun as a quiet internal dispute in the late 1950s and grown to a public controversy a decade later. Some vocal critics argued that because nuclear health and safety was a public issue it could not properly be decided or ensured by the AEC's closed-door policy process (Campbell 1988). Moreover, the AEC was under increasing pressure to open up its nuclear power licensing decision-making process to a segment of the American public that had become aroused to the potential hazards of a nuclear reactor accident. By the mid-1960s a number of local groups had formed to resist nuclear power proposals. Many of these organizations were increasingly skeptical of the Commission's risk assessments and

safety pronouncements and feared the potential ramifications of a reactor accident (Gottlieb 1993).

At the same time, the policy monopoly's congressional arm, the Joint Committee on Atomic Energy, found itself on the defensive for its forceful support of the AEC and its nuclear programs. Much like the criticism of the AEC, the debate about the Joint Committee centered on the panel's jurisdictional control over nuclear issues amid rising concerns in Congress over safety and environmental concerns fueled by critics of nuclear power. Part of the criticism centered on the Committee's unswerving support of the AEC, a support that often resembled a devotion to press forward with nuclear programs despite increasing public concerns over safety and possible environmental contamination (Allardice and Trapnell 1974, Campbell 1988). One critic focused on the AEC-Joint Committee relationship saying that the nature of the policy making structure allowed both institutions to "suppress details [and] defend mistakes" about its civilian and military nuclear programs (Rapoport 1971, 27). A handful of members of Congress criticized the Joint Committee for its zealous jurisdictional control and closed decisional processes. Morris Udall, for example, called for greater oversight of nuclear safety and environmental issues through opening up the JCAE to greater public scrutiny and scaling back its jurisdictional control. Despite the critique, the Joint Committee was able to rebuff singular actions by opponents such as Udall who failed to muster widespread support across the congressional caucus (Udall 1996).

Despite the growing criticism of the Atomic Energy Commission and the Joint Committee on Atomic Energy, little had changed between 1946 and 1970. The institutional structure of the nuclear weapons production policy monopoly remained impregnable

through the 1960s because of the vigorous way in which both institutions protected their policy jurisdiction. Information about weapons production policy was classified, and the defense-oriented nature of the policy provided a shield that further restricted public access and debate. Although both the AEC and the JCAE had been criticized about their absolute policy jurisdictions, the opposition was limited and had failed to coalesce into a force that could bring about any significant structural changes. Moreover, the criticism of the institutional structure had focused primarily on the development of nuclear power production rather than on weapons production (Gottlieb 1993).

In spite of the development of a mild detente between the U.S. and Soviet Union by the late 1960s, national security remained the predominant feature that held the structure of the nuclear weapons production policy monopoly together as the 1970s began. Quite simply, as long as the Cold War and the threat of nuclear confrontation with the Soviet Union existed, there remained the need for a vigorous nuclear weapons production policy (Clarfield and Walker 1984). In addition, although opposition to nuclear weapons production had certainly emerged by the end of the 1960s, in the form of antinuclear and disarmament groups, opponents had few institutional avenues along which to pursue their policy interests. When it came to altering nuclear weapons production policy all roads led through the Atomic Energy Commission and the Joint Committee on Atomic Energy. As we will see in the next chapter, however, the 1970s saw the development of a variety of important institutional structures designed to protect public health and the environment. These institutional structures would provide opponents of nuclear weapons production policy opportunities to expand the small, but growing conflict. Creation of the institutional

structures was driven, in part, by new ideas coming onto political agendas during the late 1960s.

The Battle Over Images and Ideas

The policy change literature indicates that the origin of change may be endogenous or exogenous to a policy monopoly (Baumgartner and Jones 1993). Endogenous change may emerge because individuals or groups within a policy monopoly challenge the prevailing understandings or assumptions about a policy and expend their energy to bring about change. Exogenous change may emerge because individuals or groups outside a policy monopoly are able to successfully present new ideas and alter images about existing policy. In examining the nuclear weapons production policy monopoly we find that the conflict over ideas and images was both endogenous and exogenous in nature.

The Conflict over Radiation Exposure

One of the important points of conflict that was both endogenous and exogenous to the nuclear weapons production policy monopoly was over the potentially negative health effects of radiation exposure. Although the AEC developed its health and safety guidelines under the assumption that there existed a threshold dose of radiation, there was no consensus, either within the AEC or among the larger scientific community, that there existed a threshold dose of radiation below which no physical harm could be inflicted. Despite official pronouncements that low levels of radiation exposure were not harmful, a handful of studies by non-AEC scientists during the late 1950s and early 1960s began to question the assumption. Scientists began to study illness and mortality rates of residents of Hiroshima and Nagasaki, military personnel who had been exposed to radiation during weapons testing in the Pacific and the U.S., and citizens in selected areas who lived

downwind from weapons sites. While the evidence was scattered, the studies suggested that even low levels of radiation exposure were potentially harmful, if not fatal, to thousands of people (Lewis 1957, Pauling 1957, Stewart 1958). A more problematic concern according to some critics was that the very agency responsible for radiation safety and health was claiming that radiation exposure presented a minimal risk, even as evidence apparently mounted to the contrary (ACHRE 1995, Gerber 1992, Wasserman and Soloman 1982). This concern first emerged during the late 1950s and would resurface again in the 1970s and 1980s.

Through congressional prompting, the AEC responded to the growing concerns, but it did so slowly and quietly. One reason for the deliberate approach to radiation safety was that the controversy had also become a problem internal to the AEC. Perhaps initially, the AEC could dismiss critics in the scientific community as uninformed, or whose research was poorly conceived and executed. As some of the AEC's own scientists began to question the Commission's radiation exposure policy assumptions, however, the agency had to deal with a growing internal crisis. A small handful of AEC scientists had begun to produce their own analyses of the health threats posed by radiation exposure. Responding to the internal concerns, the AEC established a Biomedical Research Division to further analyze the potential health effects of radiation exposure and quell public concerns. By creating the BRD, the Commission would be better positioned to control the products of research and analysis, which it did through a variety of means including classification, censorship and intimidation of AEC personnel (ACHRE 1996). Regardless, the idea that radiation was a potentially serious health threat had been elevated to a prominent position within the Commission and the scientific community as a whole. Even after the public

concern over fallout from weapons testing had subsided after the 1963 Limited Test Ban Treaty radiation exposure retained an important place on the AEC agenda (ACHRE 1996).

As a result of the health-related concerns over exposure to radioactive fallout, the AEC also expanded its study of radiation exposure at the nuclear weapons production sites (DOE 1996). In 1964, the AEC contracted Dr. Thomas Mancuso of the University of Pittsburgh to study the potential health effects of work in nuclear weapons production facilities. Part of the AEC's motivation in creating the study of its weapons plant workforce health study was to meet the political need for assurance that AEC workers were not suffering harmful effects from radiation at the production sites. The AEC was so confident that Mancuso's analysis would find nothing that some referred to the study as "Mancuso's folly," and criticized it as a "public relations sham" (Wasserman and Solomon 1982, 142). Although Mancuso's study results would not be published for a decade, the issue of worker health at the weapons plants had become a part of the AEC's agenda and the issue of radiation exposure would serve as an increasingly controversial factor during the 1970s.

New Ideas from the Scientific Community

The late 1960s also saw a maturation of a new perception by some members of the scientific community. The initial concerns of the scientific community were prompted by the early development of atomic weapons. According to Rhodes' histories of the development of the atomic and hydrogen bombs (1986, 1995) there was an unmistakable degree of unease among some in the scientific community about the powers unleashed by nuclear technology. Oppenheimer's famous utterance from the *Bhagavad-Gita*, "I am become death, the shatterer of worlds," reflected his own anxiety, and also illustrated a more widespread sentiment among many scientists that the development of nuclear

weapons had created both real and potentially catastrophic moral and environmental consequences. The destructive power unleashed by the first atomic bomb test in July 1945 essentially served to usher in the “age of ecology” where the scientific community was prompted to address the problems associated with contamination on a regional and global scale. Perhaps more than any other technological development of the modern age, nuclear weapons stimulated a new perspective in the scientific community, one which raised awareness of ecological hazards associated with advanced technology and mobilized some scientists away from purely scientific pursuits and toward political activism (Worster 1995).

Opposition by segments of the scientific community began with the publication of the *Bulletin of the Atomic Scientists* in December 1945. The *Bulletin* was ostensibly published by a handful of scientists from the MetLab facility in Chicago where much of the Manhattan Project research took place. This group used the *Bulletin* as a forum to speak out on a number of concerns including the problems of scientific censorship caused by national security, the implications of the nuclear arms race and the need for nuclear arms control, and the health and environmental problems associated with nuclear technology. During the 1950s and 1960s, for example, the *Bulletin* served as one of the few forums of public debate between scientists concerned with nuclear technology issues. To dramatize the peril posed by nuclear weapons, the *Bulletin* devised the Doomsday Clock which was used to symbolize the world’s dangerous proximity to nuclear destruction. With each negative development in the international situation or in the technical progress of nuclear weapons, the clock moved closer to midnight and seemingly inevitable nuclear annihilation.

By 1958 a small group of American scientists had formed the Committee for Nuclear Information whose aim was to lift the veil of secrecy surrounding the nuclear weapons program and expose the health and environmental dangers of nuclear power (Worster 1994). Smaller organizations of scientists and academics formed in the late 1950s and early 1960s. The mid- to late 1960s witnesses a growing concern among some members in the scientific community that scientific progress, and the scientifically driven efforts to improve the national defense, were in fact creating a whole new set of hazards to the global environment and human community (Gottlieb 1993).

Perhaps the most comprehensive statement of the new ideas emergent in the scientific community was expressed by the Union of Concerned Scientists. Formed in late 1969 by faculty and graduate students at the Massachusetts Institute of Technology, the UCS's charter statement essentially summarized a set of alternative ideas that were to gain momentum during the next decade. The UCS argued that the "misuse of scientific and technical knowledge presents a major threat to the existence of mankind." Making a particular reference to the Vietnam War, the UCS questioned the government's ability to "make wise and humane decisions." Referring specifically to the government's decision to develop multiple independently retargetable reentry vehicle technology (MIRV), the Union expressed its apprehension over the "disquieting evidence of an intention to enlarge further our immense destructive capability" (www.ucs.org). Like other scientists, the UCS expressed its dismay that nuclear arsenals were continuing to expand beyond any real military utility. Moreover, the continued refinement of weapons technology was seen as dangerous. Echoing a growing sentiment, the UCS argued that the drive to ensure

national security through more elaborate technology was actually making security less tenable (Herken 1985, York 1970).

The UCS statement was more than a mere declaration; it was an agenda for action. The UCS took issue with the seemingly undemocratic nature of scientific decision making arguing “there is a small group that helps to conceive [science] policies, and a handful of eminent men who have tried but largely failed to stem the tide from within the government. Arguing that “the concerned majority has been on the sidelines and ineffective,” the UCS stated that “it is no longer possible to remain uninvolved” (www.ucs.org). Toward that end the UCS proposed to:

[i]nitiate a critical and continuing examination of governmental policy in areas where science and technology are of actual or potential significance; devise means for turning research applications away from the present emphasis on military technology toward the solution of pressing environmental and social problems; express our determined opposition to ill-advised and hazardous projects such as the Anti Ballistic Missile system, the enlargement of our nuclear arsenal, and the development of chemical and biological weapons; and explore the feasibility of organizing scientists and engineers so that their desire for a more humane and civilized world can be translated into effective political action.” (www.ucs.org)

Perhaps more significantly, the UCS statement indicated a new activism within the scientific community; an activism which would blossom during the 1970 as some scientists devoted their energies to the emerging environmental movement.

Changes in Public Trust and Faith in Science

Changes were also underway at the societal level. As the 1960s came to an end public trust in government and faith in scientific progress appeared to be on the decline, mirroring the growing concerns and activism of the scientific community. These macro-scale changes in public opinion essentially created an image framework wherein the activities of government, including those involved with managing high technology such

as nuclear weapons production, would be subjected to critical analysis from groups and individuals who were increasingly unwilling to accept the prevailing positive images.

Lipset and Schneider (1987) examined the development of a “confidence gap” in the American body politic where there was an unmistakable decline in public confidence in public institutions over a thirty-year period. No single event fueled the confidence gap, according to Lipset and Schneider, but political controversy during the 1960s was central to the phenomenon. The significance of the confidence gap, according to the authors, was that increasingly larger portions of the American public were losing confidence in government institutions to be truthful and trustworthy about their policy activities. The specific result, according to the Survey Research Center at the University of Michigan, was a significant erosion of public trust in government from 1964 to 1970. According to the data, the proportion of respondents who felt that “you can trust the government in Washington to do what is right only some of the time” or “none of the time,” rather than “just about always” or “most of the time,” went up from 22 to 44 percent (Miller et al. 1980).

Similarly, the late 1960s saw a decline in public faith in scientific progress. Weart (1988) analyzed images associated with nuclear technology more generally and found that the number of Americans who felt “a great deal” of confidence in science declined from over one-half in 1966 to less than one-third by 1973. Weart’s analysis found a public which expressed support for the generic principle of advanced science and technology, but which expressed reservations about specific programs and their potential environmental ramifications. The fear of nuclear war and nuclear weapons more specifically emerged as the one technology that people mistrusted. The public anxiety

over the moral and environmental implications of nuclear weapons was a direct outgrowth of the radiation fallout issue of the 1950s (Worster 1995).

The emerging mood of environmentalism in the U.S. during the 1960s was, in part, a result of a decline in public faith in science and high technology and the institutions responsible for its development. Weart (1988), for example, concluded that the emerging mood of environmentalism during the 1960s had three key components: a sense of dire crisis; a concern over how pollution might affect the global environment; and, a general disillusionment with a modern culture and economic system that encouraged pollution. Within these components was a specific concern about technology authorities and the systems for which they were responsible.

The important connection between Lipset and Schneider's (1987) findings and those of Weart (1988), is that at the same time the American public was increasingly nervous about nuclear technology, they were also exhibiting a decline in confidence in government. The evidence indicates that a portion of this concern was directed at the Atomic Energy Commission over the radioactive fallout controversy and the Commission's management of nuclear power development. While nuclear weapons production remained essentially unchallenged behind a veil of secrecy, the credibility of the AEC and the Joint Committee was steadily being eroded (Metzger 1972, Rapoport 1971). Opponents of these institutions, although small in number, had begun to succeed in altering the positive images associated with the managers of nuclear technology. As we will see in the next chapter, the loss of credibility, spurred by negative images, would lead to the demise of both institutions by the mid-1970s.

Changing Images at the Grass Roots

Perhaps as significantly, a battle over images was emerging at the local level by the late 1960s. At least officially, state and local officials, along with members of the business community, were supportive of the nuclear weapons production complex, primarily because of the employment and economic benefits of the facilities. Yet there were also signs of discontent in some local communities. Much like the controversy surrounding radioactive fallout during the 1950s and early 1960s, the apprehension centered on the possible environmental and health effects of weapons production operations. Environmental, safety and health concerns at the weapons plants had existed to some degree since the establishment of the production complex, in spite of official pronouncements claiming safe operations. The concerns over radiation had spawned a small, but growing interest in the possible health effects of living near or working in the nuclear weapons complex (Gerber 1992, Gottlieb 1993).

By the late 1960s a growing concern focused on reported industrial mishaps and accidental releases of hazardous materials into the environment. Some local citizens also expressed a concern that the AEC was less than straightforward and helpful about health and environmental matters. Citizens living in proximity to AEC weapons production plants were concerned that excessive secrecy was serving not simply to hide sensitive national security information from foreign enemies, but actually concealing the true nature of possible public health and environmental hazards caused by nuclear weapons production (Rapoport 1971).

At the Rocky Flats Plant, for example, the seriousness of a May 1969 fire was downplayed by the Atomic Energy Commission despite the fact that the accident released

contaminants, including plutonium, into the area surrounding the facility (Wasserman and Soloman 1982). In the aftermath of the fire, members of the nearby scientific and academic communities formed the Colorado Committee for Environmental Information. Among other matters, members of the CCEI were upset that during the fire there were no warnings issued by the AEC that something dangerous might be happening at Rocky Flats. In fact, the AEC responded as it always had in cases where radioactive or other contamination was discovered: whatever contamination existed was well within allowable safety limits. When members of the CCEI demanded that the AEC conduct soil samples in the area to study possible plutonium deposits, the Commission refused arguing that no significant contamination had escaped as a result of the fire. Undeterred, the CCEI conducted its own soil survey and released the explosive findings that the area surrounding the facility registered plutonium in quantities between 10 and 200 times that found in the Nevada Test Site. Although the findings were immediately disputed by the AEC and DOW Chemical Corporation, the accident created a significant controversy and a degree of local and national attention (Buffer 1998).

Conclusion

As the 1960s came to an end the nuclear weapons production policy monopoly remained a potent entity. From a structural perspective, the institutional elements of the policy monopoly had changed little since its establishment at the end of the Second World War. Both the Atomic Energy Commission and the Joint Committee on Atomic Energy were the dominant actors in the policy monopoly. Their jurisdictional control was complete and they were able to make nuclear weapons production policy without any significant interference from real or potential sources of opposition. The ability of both

organizations to control information was an essential component of the policy monopoly. Moreover, the mission of both organizations was focused exclusively on exploiting nuclear technology for the needs of U.S. foreign and military policy. Other policy values, including public health and environmental protection, were subordinate to the production imperative.

Despite their strong policy monopoly, the AEC and the JCAE had come under increasingly sharp criticism for their management of nuclear technology. The focus of this criticism was on both the management and the technology. Some critics argued that the institutions could not properly balance an increasingly complex set of concerns over nuclear technology. The initial doubts were over nuclear weapons testing and later shifted to the development of nuclear power. By the end of the 1960s, doubts were also starting to emerge, albeit on a small scale, about the public health and environmental effects of nuclear weapons production. The AEC's public relations campaign, designed to assure rather than inform, was less well received than it had once been, particularly in some communities located near weapons sites. The official pronouncements of safe operating conditions and tolerable limits of radiation exposure were beginning to wear a bit thin. In spite of their strong policy making position, the AEC and the Joint Committee were beginning to suffer a legitimacy crisis.

If the policy monopoly began to appear vulnerable by the late 1960s it was due, in part, to a set of new ideas emerging across American society. The ideas were prompted by some members of the scientific community who were increasingly concerned about the health and environmental consequences of advanced technology. The health and environmental effects of nuclear weapons had been a concern among some scientists

from the outset of the nuclear age. Although widespread public anxiety over radiation exposure may have lessened after the cessation of nuclear weapons testing, the concern was slowly shifting to nuclear weapons production. By the end of the 1960s, radiation safety at the weapons plants was a controversial topic both internal and external to the Atomic Energy Commission.

As the 1960s came to an end, increasingly larger portions of society began to mirror the concerns of some in the scientific community. Coupled with changes in attitudes about the trustworthiness of government, the emerging set of ideas was to usher in a series of profound changes in the next decade which would have long-lasting effects on the nuclear weapons production policy monopoly.

Chapter V: The Emergence of Opposition and Early Policy Changes, 1970-1985

Introduction

This chapter covers the period from 1970 through 1985. As we saw in the previous chapter, the nuclear weapons production policy monopoly was a formidable structure for the twenty-five years following World War II. Despite the seemingly impenetrable nature of the policy monopoly, the foundation of opposition to weapons production policy had been laid down by the beginning of the 1970s. Questions were being raised about the potential health and environmental effects of exposure to radiation and the government's ability to effectively understand the risks and protect public health. The Atomic Energy Commission and the Joint Committee on Atomic Energy were coming under fire for their support of the development of nuclear technology, and in particular nuclear power, and for their restrictive jurisdictional and information control. As we will see below, the growing storm of criticism in Congress would lead to the abolition of both the Atomic Energy Commission and the Joint Committee in rapid succession.

During the period from 1970-1985, nuclear weapons production policy became increasingly visible at the local and national level due primarily to a string of accidents and mishaps across the complex. These events gradually increased negative attention to environmental, safety and health issues and also stimulated the formation of groups interested in policy reform. Most importantly, the image of nuclear weapons production

policy would be negatively affected by the accidents and mishaps and serve as a foundation for reform-oriented groups to argue for policy change. Opposition groups formed at both the grassroots and national levels and were involved in a variety of activities aimed at policy change. Some limited success was achieved during this period, primarily in the federal court system and in accessing the congressional venue. Finally, the opposition developed within a larger phenomenon where public confidence in government institutions declined dramatically compared to earlier decades.

The process of change in nuclear weapons production policy developed slowly, but was in place by the early 1980s. Changes in the structural elements of nuclear weapons production policy occurred, but were not significant enough to bring about widespread change. Negative policy images, however, were important in creating an atmosphere where ideas of environmental compliance would be increasingly well received in influential policy venues.

New Structures: The Growth of Environmental Regulation

Environmental policy scholars have often described the 1970s as the “environmental decade” (Lester 1995, Nash 1990). The description is based, in part, on the fact that a number of significant environmental protection measures were passed into law by the federal government. Regulatory structures covering air and water pollution, as well as the management and disposal of hazardous materials, either built upon existing statutes through new amendments, or were established for the first time. Table 5.1 provides some of the most important pieces of legislation that emerged during the period

of time covered in this chapter as a result of vigorous policy activity by the federal government.

Table 5.1: Major Federal Environmental Legislation, 1969-84

Year	Major Federal Environmental Legislation
1969	National Environmental Policy Act
1970	Clean Air Act Amendments
1970	Occupational Safety & Health Act
1972	Water Pollution Control Act
1973	Endangered Species Act
1974	Hazardous Materials Transportation Act
1974	Safe Drinking Water Act
1976	Toxic Substances Control Act
1976	Resource Conservation and Recovery Act
1976	Solid Waste Disposal Act
1977	Uranium Mill Tailings Radiation Control Act
1977	Clean Air Act Amendments
1977	Clean Water Act Amendments
1980	Safe Drinking Water Act Amendments
1980	Superfund (CERCLA)
1984	Hazardous and Solid Waste Act Amendments

Source: Nash (1990)

Reviewing the environmental regulatory structures created during the 1970s reveals three key characteristics found throughout the laws that played a key role in fostering change across a number of policy areas. First, the regulations focused on the control of pollutants and toxic substances. In contrast to federal environmental legislation prior to the 1970s, the laws that emerged during the 1970s and 1980s reflected a heightened concern for the environmental and public health hazards associated with an advanced industrial society (Lester 1995).

Second, the laws contained distinct mechanisms to enable public participation in environmental protection policy. The 1960s had seen an explosive growth in political

activism by many sectors of American society. This activism, driven in part by the presence of a desire for greater democratization of the political process, found its way into the new environmental legislation (Milbrath 1984). Many laws, the National Environmental Policy Act (NEPA) and Toxic Substances Control Act (TOSCA), for example, contained explicit requirements and institutional structures for public comment and participation in policy decision-making processes (Nash 1990). Perhaps most importantly, many of the new statutes provided avenues for interested parties to pursue legal action in the federal court system if federal agencies failed to effectively pursue their statutory obligations under the new legislation.

Third, because many of the statutes required federal agencies to comply with state environmental standards, states became recipients of enhanced regulatory powers and capacity. State capacity was improved either through establishing and enhancing their own environmental protection measures, or by utilizing available federal resources for the achievement of the same ends (Lowry 1992, Ringquist 1993). According to Goewey (1987) much of the legislation that had emerged by the mid-1980s was designed to foster a partnership approach to environmental protection wherein federal and state governments would combine their respective resources to more effectively address environmental problems. A significant component of these state powers, which would be utilized during the 1980s in the campaign against nuclear weapons production policy, was the ability to apply pollution control and toxic substance regulations against federal facilities. Although these powers were not to fully mature until the 1980s and 1990s, an entirely new approach to federalism in environmental policy was clearly in the works (Costain and Lester 1995).

Another institutional product of the environmental decade was the creation of a set of new organizations designed to implement and enforce environmental legislation. The most important federal organizations were the Council on Environmental Quality (CEQ), the Environmental Protection Agency (EPA), and the Occupational Safety and Health Administration (OSHA). These organizations were equipped with scientific expertise, analytical capacity, enforcement and oversight powers, and varying degrees of independence from power centers in the executive and legislative branches (Rosenbaum 1995). Even within existing agencies such as the Atomic Energy Commission, environmental offices were established in order to address the emerging set of policy concerns (Allardice and Trapnell 1974). Finally, the organizational developments at the federal level were mirrored by many state governments, which created their own organizational structures and administrative processes to manage their capacity for environmental policymaking and implementation (Lowry 1992).

It is important to note that the environmental protection framework emergent from 1970-1985 was not aimed specifically at nuclear weapons production policy. However, the new regulatory framework did create a set of mechanisms and structures that reform proponents utilized in their efforts to foster weapons production policy change. Although there was growing controversy about the operations of nuclear weapons production, the AEC (until 1974) and DOE (after 1977), along with key allies in Congress and other executive branch agencies, were able to rebuff efforts to alter their self-regulatory powers, the cornerstone of the policy monopoly. Nevertheless, the participatory mechanisms of new environmental laws, coupled with the focus on regulating hazardous and toxic materials, created an expansive framework wherein opponents of nuclear weapons

production policy could effectively utilize the new structures in their efforts to expand conflict and shop for venues which might prove receptive to their policy causes. These efforts will be examined in greater detail below.

Organizational Changes: Decline and Fall of the AEC/Creation of the DOE

As we saw in chapter 4, the organizational structure of the nuclear weapons production policy monopoly, specifically the Atomic Energy Commission and the Joint Committee on Atomic Energy, represented a formidable institutional arrangement. Both institutions had been created in 1946 during a wave of enthusiasm over the development of nuclear technology and the advent of nuclear weapons. Through the 1960s, both had enjoyed enormous success in driving the development of nuclear technology forward and in expanding the size and destructive power of the U.S. nuclear weapons arsenal. Since the Atomic Energy Act of 1946, both the AEC and JCAE had been unswerving proponents of developing nuclear technology and the members of each institution had worked hard to ensure that few political or institutional barriers stood in the way (Allardice and Trapnell 1974, Green and Rosenthal 1963).

By the 1970s, however, the AEC's vigorous promotion of nuclear technology had come under fire from groups and individuals who argued that it was impossible for a single organization to both promote and regulate with any degree of objectivity. Although much of the controversy centered on nuclear power production, there was growing general concern over whether the Commission could act as an objective entity in protecting the environment and public health from the risks associated with nuclear weapons production (Boffey 1971). What made the issue difficult for the AEC, and negatively impacted the public image of the Commission, was that internal dissent over

radiation safety, which had been brewing for over a decade, finally spilled over into the public realm. Top scientists from AEC laboratories were not only publicly questioning AEC radiation exposure policy, but were arguing that AEC standards were as much as 100 times too weak (Gofman and Tamplin 1970). The AEC's effort to silence its internal critics, by pressuring its personnel not to publish or speak about their theories, and a clumsy effort to purge dissenting scientists from their positions in the organization, merely fueled the controversy and raised difficult questions about the agency's credibility to both promote and regulate the development of nuclear technology (Boffey 1970, Wasserman and Soloman 1982).

The opposition to the AEC grew steadily in Congress where an increasing number of members grew more vocal about the Commission's mounting controversies. By the early 1970s, it was commonplace for amendments to emerge in Congress that called for changing the AEC's jurisdictional authority and remove specific nuclear weapons-related items from AEC budget proposals. Although most of the proposals were handily defeated, it was clear that the Commission's formerly high status in Congress was eroding. Moreover, some members of Congress voiced their concern that the development of nuclear technology, in all its various forms, had expanded at such a rapid rate that the Commission lacked the organizational capacity to effectively accomplish its administrative and oversight functions (CQ Annual 1970-1975). Recognizing these limitations, the Nixon administration proposed splitting AEC functions into two separate agencies in 1970. Unlike a decade earlier, there was now a viable opposition force within Congress and this opposition was energized by questions about the very legitimacy of the AEC in light of the mounting controversies associated with the development of nuclear

technology power (see for example: Gillette 1972). One line of argument focused on splitting the AEC's nuclear regulatory and promotional functions, while another focused on stripping the Commission of its entire radiation health authority and transferring those functions to another, more impartial, federal agency. The underlying idea of the political conflict, which would serve as the foundation for nuclear weapons production policy change even beyond the existence of the AEC, was that the institutional structure's power of self-regulation needed to be overhauled (CQ Annual 1975).

While the majority of political conflict focused on the AEC's questionable support for the safety of commercial nuclear power reactors, other concerns emerged which raised specific questions about the safety of the Commission's nuclear weapons production policy. A series of high profile events occurred across the complex and raised serious questions about safety. A 1969 fire at Rocky Flats (Shapley 1971) and radioactive tritium leaks there in 1973 (Sterba 1973), coupled with nuclear waste leaks at the Hanford facility and charges of mismanagement by the AEC's prime contractor (Gillette 1974), contributed to growing safety questions in the operations of the nuclear weapons complex. It is clear, however, that despite these problems, the demise of the AEC was primarily the product of conflict over non-weapons production issues (Duffy 1997). Nevertheless, the accidents and mishaps, and their environmental, safety and health implications, for local workers and nearby populations created a framework within which political conflict would increasingly be waged (Wasserman and Soloman 1982).

After a relatively short debate the Energy Reorganization Act of 1974 (P.L. 93-438) abolished the Atomic Energy Commission and transferred its functions to two new agencies. The nuclear weapons production program was transferred to the Energy

Research and Development Administration (ERDA), while the Nuclear Regulatory Commission (NRC) was given the AEC's licensing and related regulatory authority over all commercial uses of atomic energy including waste disposal from commercial power production. The ERA also established an Assistant Administrator in charge of environment and safety with authority to establish and enforce environment, safety, and health standards, including waste standards for all activities of the new ERDA.

According to a Senate report accompanying the legislation, the environmental, safety and health "oversight responsibility would extend to such vital areas as low-level radioactive emissions from reactors [and] leakage of high-level radioactive wastes from disposal and storage facilities." The Act also extended discretionary authority within ERDA to protect the public health and safety in weapons production activities. The Senate report stated that the health and safety function is "especially imperative in the noncommercial research and development area (i.e., defense nuclear programs) because the new [Nuclear Regulatory] Commission will have no licensing jurisdiction over such ERDA activities" (quoted in Fিন্নamore 1984, 30).

More organizational changes occurred in 1977 with the Department of Energy Organization Act (P.L. 95-91). The Department of Energy (DOE) was created primarily to deal with the need to establish and coordinate a national energy strategy, and contained virtually nothing about nuclear weapons production policy (Fehner and Holl 1995). The Act merely transferred the ERDA's nuclear weapons and national security functions to the new Energy Department. The Act did not require any special or specific action by DOE in managing its own radioactive waste; rather, the DOE retained discretionary authority to act in this area much like its predecessor agencies. Moreover, the Act did not

significantly alter the 1954 Atomic Energy Act and therefore did not address the disposal of hazardous or mixed waste generated by nuclear weapons facilities (Finamore 1985).

Examining the Energy Reorganization Act and the Department of Energy Organization Act reveals important similarities that maintained the basic structural integrity of the nuclear weapons production policy monopoly. First, neither act altered the structure of authority over nuclear weapons production policy. While Congress recognized the growing problems in the weapons production complex, the self-regulatory powers of the administrative authority over the policy were maintained intact. Second, although there had been legislative proposals for creating some degree of oversight independent of the existing organizational structure, Congress settled instead for expanding the environmental functions of the ERDA and the DOE, preferring to continue relying on agency discretion to address the issues (Finamore 1984).

More organizational changes appeared to be in the works in 1981-82 when the Reagan administration proposed to cut the size of government by abolishing several executive branch agencies including the Department of Energy. Although the administration argued that substantial budget savings would result from reorganization, the idea of abolishing the DOE received little support in Congress. One of the key stumbling blocks was what to do with the agency's nuclear weapons production program. Suggestions to place the program under the Department of Defense met with strong opposition from members of Congress and the growing arms control community who argued that nuclear weapons production had, from the beginning, been under civilian control and should remain that way. In addition, placing the program under the Commerce or Interior Departments did not receive widespread support because of

concerns that transferring the program would actually require greater budget expenditures due to administrative changes. Similar concerns about cost also undercut support for creating an independent nuclear weapons agency (Fehner and Holl 1995). In the end, the Reagan plan died a quiet death in Congress where few proposals to abolish the DOE were reported out of committee (CQ Almanac 1982, 1983).

Changes in Congressional Structure: Demise of the Joint Committee

The 1970s also ushered in a period of congressional reform. The elections of 1974 and 1976 were followed by significant changes in the number and composition of committees, as well as changes in the operation of the seniority system in both chambers of Congress (Deering and Smith 1997). The reforms that swept through Congress also swept aside the Joint Committee on Atomic Energy.

Ultimately, the JCAE succumbed to many of the same forces that led to the abolition of the AEC. There was a growing consensus in Congress that the scope of nuclear technology and its varying environmental and health concerns, including weapons production, had expanded at a pace that had outstripped the capacities of a single committee (CQ Almanac 1977). In addition, some members of Congress were concerned that the JCAE's control over nuclear-related information had led to excessive secrecy, fostering a situation where important policy decisions were being made without adequate public debate. Particularly as environmental and safety issues grew in importance, congressional quiescence to JCAE jurisdiction quickly evaporated (Naughton 1973). Repeated efforts were made by certain opponents of nuclear technology issues to gain access to the JCAE. Alaska Senator Mike Gravel, for example, had pressed for membership on the JCAE since 1968 only to be blocked on each occasion by JCAE

member Henry Jackson (D-WA). Though Gravel never gained a seat on the panel he proved to be a gadfly concerning the committee's policy authority and made repeated efforts to block legislation through parliamentary procedures (CQ Almanac 1976). Moreover, newer members of the committee were less enthusiastic about nuclear technology programs generally and increasingly skeptical of nuclear weapons programs, due to growing concerns over budgetary and arms control issues (CQ Almanac 1977).

From a larger perspective, as energy policy became more important in terms of its economic implications, a larger number of congressional representatives developed an interest and sought greater avenues for policy activism (Jones 1979). Also, as energy issues grew in importance, and as the environmental effects of energy policy became better known, the 94th Congress voted to split non-nuclear energy programs away from the JCAE and divide environmental components of energy policy jurisdiction between the Joint Committee and the House Science and Technology Committee (CQ Almanac 1976).

The 1976 election brought about widespread personnel changes in the Joint Committee when seven of eighteen committee members left Congress (CQ Almanac 1978). The personnel changes, particularly the retirement of long-time Committee members Chet Holifield and Craig Hosmer, left the JCAE defenseless in the face of mounting attacks. Representative Jonathan Bingham (D N.Y.), a long-time critic of the Joint Committee's policy control, was able to bring a bill calling for the abolition of the panel to a vote among the Democratic majority caucus. After a brief and one-sided debate, the end for the JCAE came quickly as the new Democratic majority 95th Congress abolished the panel in January 1977 as part of a comprehensive package of House

reforms. The once solid jurisdiction of the JCAE was parceled out to a handful of committees in the House as illustrated in Table 5.2.

Table 5.2: House Jurisdiction, 1977

Committee	Policy Jurisdiction
Armed Services	Military Nuclear Concerns
Interior & Insular Affairs	Regulation of Nuclear Industry
International Relations	Nuclear Export Regulation
Space, Science & Technology	Nuclear Research & Development
Interstate & Foreign Commerce	Facilities Regulation & Oversight

Source: CQ Almanac 1978

The Senate quickly followed suit in February with a committee reform package of its own. Despite some controversial elements in the Senate reform package, the new jurisdictional structure resembled the House system in some respects, but also included the creation of two new standing committees to handle the expanded policy jurisdiction as illustrated in Table 5.3.

Table 5.3: Senate Jurisdiction, 1977 (* indicates new committee)

Committee	Policy Jurisdiction
Armed Services	Military Nuclear Concerns
*Energy & Natural Resources	Non-military Nuclear Technology
*Environment & Public Works	Non-military Nuclear Regulation

Source: CQ Almanac 1978

Although jurisdiction over military nuclear programs of the Joint Committee were assumed by Armed Services Committees in both House and Senate chambers, the new committee system suddenly created a fractured system of authority over nuclear technology more generally. In addition, the creation of committees with environmental policy jurisdiction created significantly more venues for policy reform proponents to access Congress. Although the demise of the Joint Committee on Atomic Energy was not

specifically related to problems in the nuclear weapons complex, the reality was that the most ardent structural proponent of nuclear weapons production policy in the Congress, and a key component of the policy monopoly, had ceased to exist. The new committee structure altered the balance of power in the Congress and placed allies of policy reform in key committee venues. These were individuals who possessed attitudes about nuclear technology, and nuclear weapons policy, which were markedly different than their predecessors on the Joint Committee (Duffy 1997, Udall 1994).

Growth of Congressional Attention to Nuclear Weapons Production Policy

The punctuated equilibrium model theorizes that congressional attention to policy issues, as well as the tone of that attention, is vital for explaining policy change. Changes in the congressional structure can open up new policy venues and, at least theoretically, created additional avenues for policy reformers to press for change (Baumgartner and Jones 1993). Figures 5.1-3 provide an overview of congressional attention to and tone regarding nuclear weapons production policy from 1970 through 1985. The congressional hearings data presented below were drawn from the Congressional Information Service (CIS) database available through the Lexis-Nexis service available on the world wide web. The hearings presented in the figures below dealt only with nuclear weapons production policy. Key word searches focused on specific weapons production sites (e.g., Rocky Flats), the terms atomic and nuclear weapons production, and agency names (e.g., the Atomic Energy Commission). There were many hearings during 1970-1985 that focused on issues associated with plutonium, reactor designs, and radiation and ES&H issues. Only a small percentage of these hearings, however, focused

specifically on those topics within the context of nuclear weapons production policy.

Only those hearings that dealt with nuclear weapons production were included in the content analysis in this chapter. The total number of congressional hearings on nuclear weapons production policy during 1970-1985 as indicated in Figure 5.1 is 59.

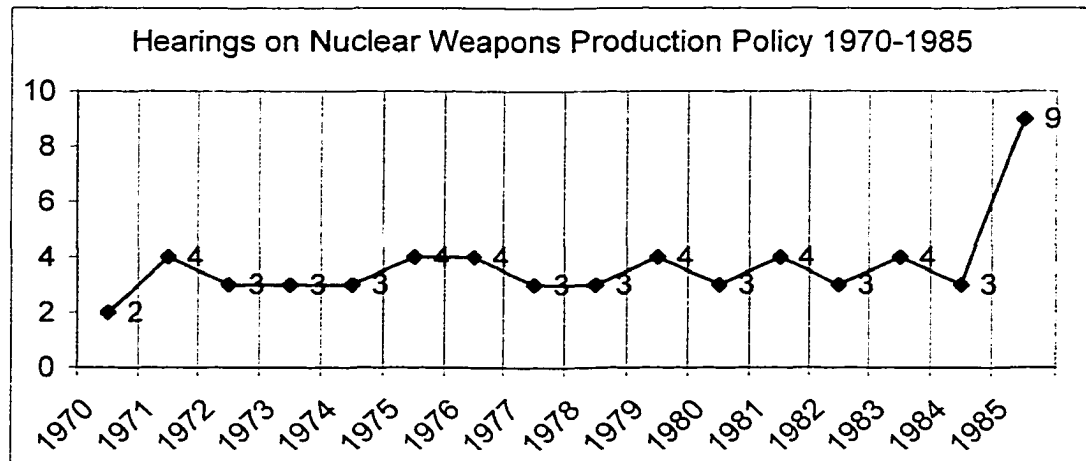


Figure 5.1: Congressional Hearings on Nuclear Weapons Production Policy, 1970-1985

In addition to the limited number of hearings between 1970-1985, the scope of hearings across the congressional body also indicates the closed nature of nuclear weapons production policy decision making. Table 5.4 presents the distribution of hearings by committee across Congress from 1970-1985. As the punctuated equilibrium model would predict, congressional committees that were key components of the policy monopoly were the locus of nuclear weapons production policy making in Congress from 1970-1985. Other committees held hearings only on a limited and irregular basis, and were essentially excluded from the debate over nuclear weapons production policy. As indicated in Table 5.4, the ratio of hearings held by policy monopoly committees (i.e.,

armed services and appropriations committees) vs. non-monopoly committees was roughly 2:1.

Table 5.4: Hearings by Committee, 1970-1985

House Committee	Hearings	Senate Committee	Hearings
Appropriations	7	Appropriations	6
Armed Services	6	Armed Services	5
Energy/Commerce	5	Env/Public Works	2
Space/Science/Technology	5	Energy/Nat Resources	2
Interior/Insular Affairs	2	Government Operations	1
Government Operations	2		
Interstate/Foreign Commerce	1		
Joint Cmte. On Atomic Energy			
	15		

Figure 5.1 above indicates that annual attention devoted to nuclear weapons production policy by Congress, as measured by hearings, was minimal. A more specifically important feature of congressional hearings during 1970-1985 was the subject matter of the hearings. Figure 5.2 illustrates the primary topic of congressional hearings coded either as routine issues or as environmental, safety and health issues. Routine hearings focused on authorization and appropriations issues, as well as operational matters dealing with infrastructure or contractors at the weapons production complex. ES&H hearings dealt specifically with environmental, safety and health issues of nuclear weapons production policy. For the period 1970-1985, 57 hearings were identified and coded with 42 (74 percent) characterized as routine while 15 (26 percent) focused on environmental, safety and health issues. Aside from the obvious balance in favor of routine issues, the number is more remarkable because between 1970 and 1983 environmental, safety and health issues were the specific focus of a mere six

congressional hearings. Even hearings that focused on the Rocky Flats fire of 1969, and nuclear waste leak problems at Hanford, focused primarily on how those accidents would impact materials and weapons production schedules, rather than on the wider ES&H implications. In short, the key congressional elements of the policy monopoly chose to focus minimal attention on environmental, safety and health issues of weapons production policy even when serious accidents occurred. It was only during the Mancuso controversy of 1978 and the emergence of the 1982-3 controversies at the Oak Ridge and Savannah River facilities when ES&H issues received the attention of hearings convened specifically to examine problems in the nuclear weapons production complex. Also, the figure illustrates that 1985 was a potentially important year for policy change because for the first time, ES&H matters, particularly at the Fernald, Ohio facility, rather than routine budgetary matters, were the focus of congressional attention.

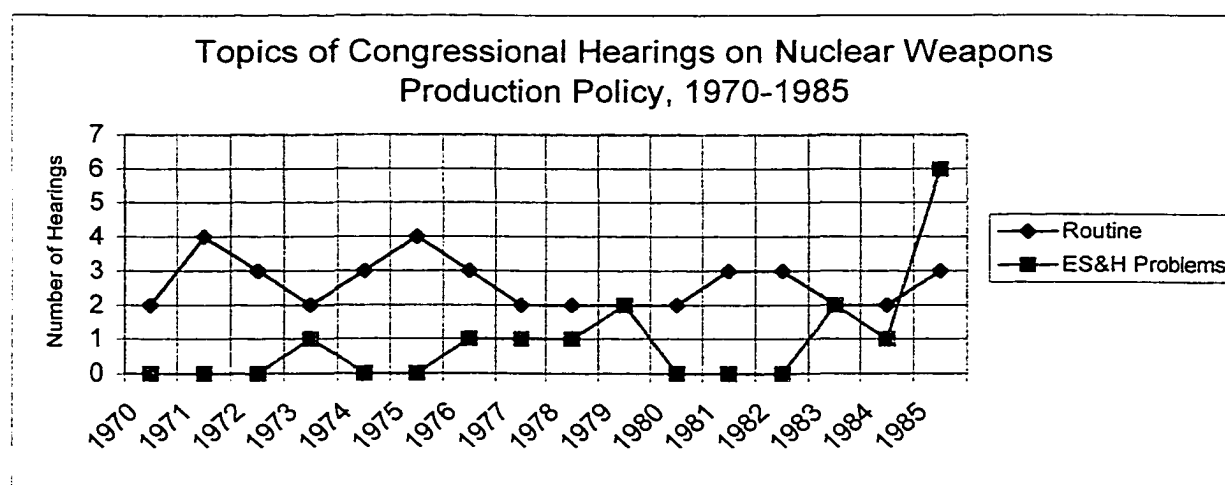


Figure 5.2: Topics of Congressional Hearings, 1970-1985

It is also important to mention the important difference between the tone of routine and ES&H hearings. The former were overwhelmingly positive while that latter

were decidedly negative. The routine hearings were essentially absent of conflict and characterized by a consensual nature of testimony and topics of discussion. The consensual nature of the routine hearings was due to the fact that the witnesses giving testimony were members of the policy monopoly or government officials from other agencies who presented supportive or uncritical views about some aspect of nuclear weapons production policy.

On the other hand, each of the ES&H hearings could only be defined as conflictual. The ES&H hearings focused on such controversial issues as the Savannah River reactor restart, the Oak Ridge and Fernald contamination, and the general health effects of radiation, none of which could be coded as positive or absent of conflict. ES&H hearings were characterized by criticism of nuclear weapons production policy either from opposition groups or other government officials presenting negative or critical testimony and analyses of policy problems. Although members of the policy monopoly were witnesses at ES&H hearings, their testimony was the focus of critical analysis and review.

Figure 5.3 presents an illustration of the overall distribution of witnesses in congressional hearings from 1970-1985. Witnesses were coded according to their affiliation and/or statements made during their testimony. Witnesses coded as “monopoly” were directly affiliated with the institutional structure of weapons production policy and primarily included individuals from the AEC/DOE as well as the Department of Defense. Witness coded as “reform” were affiliated with national and grassroots organizations which sought policy change or registered some amount of criticism of nuclear weapons production policy in their testimony. Also included in this category

were representatives of state and local governments who presented testimony in favor of policy reform. A third category was coded as “other” and represents witnesses who were not clearly members of the policy monopoly or members of the reform group. The “other” category included representatives of the Environmental Protection Agency, the General Accounting Office and other government agencies that provided testimony on weapons production policy, as well as individuals from the academic and research communities who presented testimony on a variety of technical issues. The number of witnesses per hearing varied greatly from a low of 3 to a high of 59.

What Figure 5.3 illustrates is that the witness list at nuclear weapons production policy hearings was dominated by members of the policy monopoly. In fact, until the 1978 hearings about the health-related issues of radiation exposure, no members of the policy reform community were identified as witnesses in *any* congressional hearings. Starting in 1983, however, with contentious hearings about the restart of production reactors at Savannah River, and the contamination at Oak Ridge, members of the policy reform community became regular participants in congressional hearings (Norris, e-mail 1998). Apparently, the growing seriousness of the accidents and contamination had generated sufficient attention in Congress and opened the hearings process to concerned national and local organizations. The overall distribution among the three categories of coded witnesses during the study period was: Monopoly 61 percent; Reform 24 percent; Other 15 percent. Given the predominance of policy monopoly-oriented witnesses during 1970-1985, a phenomenon we would expect given the behavior of policy monopolies, reform ideas were infrequently aired in Congress. With regards to policy change, which requires that new ideas reach key political agendas, Figure 5.3 illustrates that based on the

general topic of individual congressional hearings, reform ideas were simply not part of the congressional debate until 1978 and not an annual dynamic until 1983.

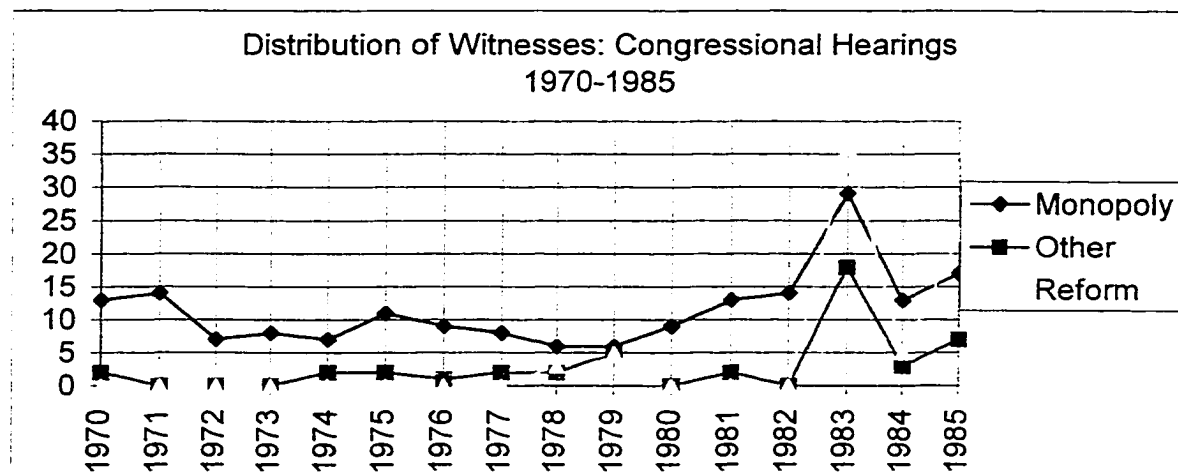


Figure 5.3: Distribution of Witnesses at Nuclear Weapons Production Policy Hearings, 1970-1985

Perhaps more important than the general congressional attention paid to nuclear weapons production policy, and the generally negative tone of ES&H hearings, was congressional action taken toward initiating policy change. As we saw in Figure 5.2, the majority of congressional hearings in 1985 focused on environmental, safety and health issues as opposed to routine budgetary matters. Table 5.5 illustrates legislative action taken by Congress during the period 1970 to 1985 specifically related to nuclear weapons production policy. Only a handful of examples can be found in the CIS database and for opposition forces, concrete success was clearly not forthcoming. One example of symbolic success, however, came in 1982 when the House of Representatives passed a resolution supporting a freeze on the deployment of new nuclear weapons (CQ Annual 1982). Nevertheless, the legislative proposals offered by 1985 illustrate the manifestation of key policy reform ideas in the Congress and indicate the potential for significant

institutional changes. For example, in 1985 Congress revisited the debate about the proper organizational authority over radiation health effects. This debate first surfaced in the late 1950s and reemerged at several points during the 1970s, but no legislative proposals were drafted due to the staunch opposition of the AEC, ERDA and DOE, and their allies in the armed services committees (CQ Annual 1985). By 1985, however, the institutional structure was more permeable, due in part to a larger number of committees and subcommittees with some type of ES&H jurisdiction, coupled with the increasing interest in ES&H issues at the nuclear weapons complex. Moreover, the positive images that had once supported nuclear weapons production policy were in decline. Although none of the legislative proposals introduced in 1985 received widespread support, there was a sense that the threshold for policy change was at hand. What was needed was a stimulus to expand the political conflict and sway congressional opinion regarding nuclear weapons production policy.

Table 5.5: Congressional Action on Nuclear Weapons Production Policy, 1970-1985

Year	Legislation Introduced and Action Taken
1982	Hart-Simpson-Mitchell amendment to the FY82 Nuclear Regulatory Commission Authorization. Placed restrictions on reprocessing spent commercial nuclear fuel for military purposes.
1985	Nuclear Waste Policy Amendment Act of 1985. Bill would provide Oregon residents participation in selection of nuclear waste repository. A companion bill would remove the Hanford Reservation from consideration as the nation's high-level nuclear waste repository. These bills emerged over concerns about radioactive contamination at the Hanford site. NWPAA was not reported out of committee.
1985	Military Radioactive Emissions Control Act of 1985. Proposal would require EPA to establish and monitor radioactive emissions control standards for DOE nuclear weapons production facilities. The proposal was not reported out of committee.
1985	Radiation Research Reorganization Act of 1985. Proposal would transfer authority for epidemiological research on radiation health effects from the Department of Energy to the Department of Health and Human Services. Companion bills were reported out of House and Senate committees, but not acted upon by either chamber.
1985	Mixed Hazardous Waste Amendment Act of 1985. Proposal to amend the Solid Waste Disposal Act to clarify EPA jurisdiction over DOE mixed waste. Bill was not reported out of committee.

DOE Embarks on Policy Change: Defense Waste Management

The Department of Energy was also a locus of policy change during the period 1970-1985. Despite a strong focus on the mission of nuclear weapons production, the DOE initiated limited environmental cleanup activities at its Oak Ridge and Savannah River facilities. In 1983 the DOE embarked on a program to repackage millions of gallons of liquid defense wastes stored at Savannah River. Funding for the Defense Waste Processing Facility (DWPF) was initially approved in 1983 and construction began in 1984. The DWPF was designed to package radioactive and other hazardous waste materials from the weapons production process in a borosilicate glass material and cement for eventual disposal in a permanent site (Marshall 1987). The DWPF became operational in 1991 when it began to process waste materials held in 51 aging storage tanks at Savannah River. Although the process of relocating the waste a final burial site was several years away, the cleanup process at Savannah River was underway by 1984.

Another component of cleaning up the legacy of nuclear weapons production was the creation of the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. Although the danger of nuclear weapons waste was recognized early in the policy history, only interim solutions such as storing the waste in steel tanks and holding ponds had been implemented. Recognizing the need for a permanent solution to the defense waste issue Congress authorized the development of WIPP in 1979. Construction began in 1983 with the goal of accepting waste as early as 1989, but cost overruns, coupled with a bruising political conflict between New Mexico and the DOE, delayed the opening of the facility until spring of 1999. Despite the delays and conflict over WIPP, the process of developing the site was in place by the early 1980s indicating that addressing the legacy

of weapons production was on the agenda of both Congress and the DOE (Fehner and Holl 1995).

While it may be debatable whether the defense waste management program is evidence of policy change, the program did represent the first significant effort to establish a more permanent solution to the problems posed by the waste materials from nuclear weapons production. As such, the institutional structure could be seen as integrating a more permanent solution to a component of the ES&H problem of weapons production policy, rather than continuing to rely on precarious interim storage solutions. Given the fact that much of the attention directed toward weapons production policy was due to problems of waste management, the development of the DWPF and the WIPP facility was certainly an important departure.

Policy Images at the National Level

The punctuated equilibrium model assumes that positive images are essential for the maintenance of a policy monopoly. As images become negative, however, the potential for policy change becomes greater. The key dynamic is that negative images draw the attention of key policy making venues that can act to alter policy (Baumgartner and Jones 1993). This section illustrates attention and tone of the national media's coverage of nuclear weapons production policy.

Before examining the national-level images, it is important to present basic information that illustrates some of the important events in nuclear weapons production policy from 1970-1985. This is particularly useful for the purposes of this section because, as the content analyses revealed, the attention and tone of both national and local media coverage was directly tied to a series of accidents and mishaps that plagued the

nuclear weapons complex starting in 1969. The accidents and mishaps not only garnered media attention, but also apparently stimulated the development of national and grassroots opposition groups. Perhaps most importantly, the string of events contributed to a negative image of nuclear weapons production policy. In addition, the fact that these accidents and revelations occurred on a regular basis ensured that the story was perpetual. Drawing from all available data sources, Table 5.6 illustrates the most important events that received media coverage.

Table 5.6: Major Events in the Nuclear Weapons Production Complex

Year	Event
1969	Fire at Rocky Flats/revelation of over 100 minor fires since plant opening
1970	Plutonium found in soils near Rocky Flats
1970	Negative report on nuclear waste management at Idaho National Engineering Lab
1971	AEC official describes Hanford Reservation reactor as unreliable and unsafe
1973	Radioactive tritium found in water supply of communities near Rocky Flats
1973	Nuclear waste leak at Hanford/investigation reveals periodic leaks since late 1950s
1974	Milham study of occupational deaths in Washington implicates Hanford radiation work
1975	Hanford reactor termed unsafe by former safety supervisor
1976	Nuclear waste explosion at Hanford; workers injured
1976	Mancuso-Stewart health analysis of Hanford workforce indicates high cancer death rates
1977	ERDA admits Rocky Flats operations produce unavoidable plutonium releases
1979	Nuclear waste leaks into Snake River from Idaho National Engineering Lab
1980	DOE Inspector General reports nuclear waste management cover up at Hanford
1980	First reports of uranium contamination at Fernald
1983	Extensive mercury pollution found at Oak Ridge/accusations of cover up
1983	Ground water pollution found near Savannah River site/reports of rare diseases
1984	Uranium dust release at Fernald/revelation of past accidents

The national-level policy images recorded below are drawn from story and article headlines in the *New York Times* and the *Reader's Guide to Periodical Literature*. The content analysis reported here placed the available information into three general categories: positive, negative and neutral/uncodable. Positive stories included those indicating some government action designed to address ES&H problems in nuclear

weapons production policy, or information regarding positive reports about ES&H issues, such as a government analysis indicating a low health risk to workers or the public. Stories coded as negative were those dealing with accidents, health hazards, contamination, protests, or stories that indicated some degree of policy conflict. Also included in the negative category were stories dealing with cancer rates of workers and citizens living in proximity to weapons production sites. Stories coded as neutral or uncodable dealt with miscellaneous and operational issues, including budgetary information, which were neither clearly positive nor negative. The total count from each media source is reported in the respective figures.

Figure 5.4 illustrates the extent of nuclear weapons production policy coverage found in the *New York Times* as averaging roughly 13 stories per year. Notably, 121 of the 204 stories (59.3 percent) identified between 1970-1985 concerned environmental, safety and health issues of nuclear weapons production policy while 51 stories (25 percent) covered policy administration and jurisdictional issues. The remaining 32 stories (15.7 percent) dealt with routine weapons production policy issues such as budget and general operational information. During this same time period the *New York Times* featured an additional 91 stories about radiation exposure and nuclear technology policy administration. Although these stories did not directly focus on nuclear weapons production policy, and were not included in the figures below, they were part of the general coverage of the growing controversial context surrounding the policy. In general, *New York Times* coverage of nuclear weapons production policy could only be described as sporadic.



Figure 5.4: *New York Times* Attention, 1970-1985

As Figure 5.5 indicates, the majority of coverage by the *New York Times* was primarily of a negative tone. A majority of the stories found in the *New York Times* dealt with accidents and associated controversies in the weapons complex and illustrated a decidedly negative tone particularly concerning environmental, safety and health matters. The *Times* also covered the protests and demonstrations at weapons sites across the country that occurred with greater frequency through the 1970s. These stories were coded as negative because the demonstrations were designed to focus public attention on the environmental, safety and health issues of weapons production policy. In addition, stories about protest activities invariably illustrated some degree of policy conflict and indicated various policy reform positions.

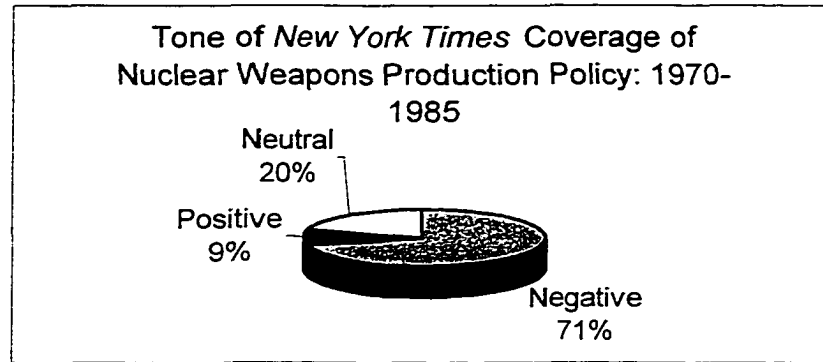


Figure 5.5: *New York Times* Tone, 1970-1985

A second source of national media attention and tone is found in the *Reader's Guide to Periodical Literature*. Figure 5.6 illustrates that media coverage of nuclear weapons production policy as recorded in the *Reader's Guide* was sparse, averaging less than 5 stories per year during 1970-1985. This minimal coverage was even less available to the general public because just 10 percent of the stories (8 of 79) were found in mainstream weekly new publications such as *Time*, *Newsweek* or *U.S. News and World Report*. According to the data available in the *Reader's Guide*, the vast majority of nuclear weapons production policy coverage was found in specialized journals such as *Science* and *Science News* along with a handful of trade-industry publications. This can likely be accounted for because many of the weapons complex accidents which found their way into national journal coverage were examined from a science-oriented approach. Although it is not apparent from the available data, mainstream news publications may have deemed the incidents "too scientific" for the general public. Additional coverage was found in decidedly left-leaning publications such as *Mother Jones* and *The Nation*. In short, nuclear weapons production policy was simply not a prominent feature story among the mainstream publications listed in the *Reader's Guide*.

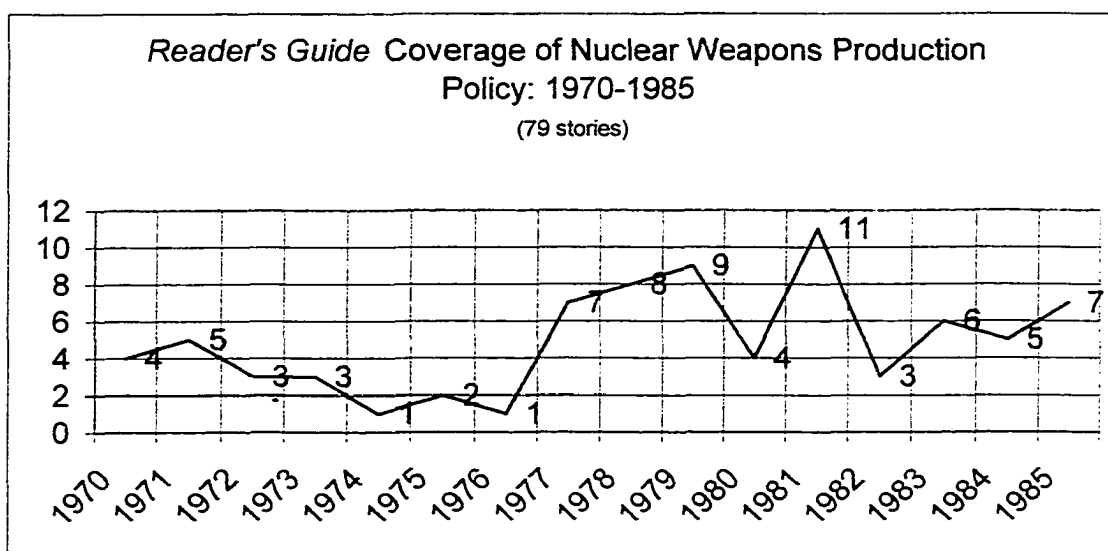


Figure 5.6: *Reader's Guide to Periodical Literature* Attention, 1970-1985

Although the *Reader's Guide* coverage of nuclear weapons production policy was minimal, it too was decidedly negative as indicated in Figure 5.7. In a pattern similar to that found in the *New York Times*, and repeated in local media coverage illustrated below, the majority of coded stories were negative. Again, the nature of the news, primarily accidents and mishaps, coupled with controversy over health-related issues, created an overwhelmingly negative policy image. Other articles dealt with operational matters that could only be coded as neutral.

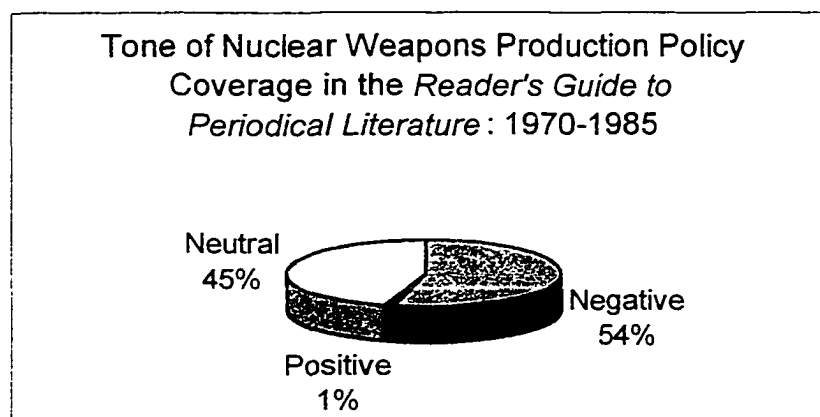


Figure 5.7: *Reader's Guide* Tone, 1970-1985

Policy Images at the Local Level

As Table 5.5 illustrates, the image of nuclear weapons production policy was beset by a series of accidents, mishaps and controversies that contributed to a negative policy image. This section examines the policy image from the local-level perspective. Using the same content analysis applied to media coverage at the national level, the attention and tone of three regional newspapers will be examined here: the *Denver Post*, the *Cincinnati Enquirer*, and the *Seattle Times*. Each of these publications is the largest regional daily newspaper near, respectively, Rocky Flats, the Hanford Reservation, and the Feed Materials Production Center at Fernald, Ohio. The summary data presented here represents a content analysis of available headlines from 1970 through 1985.

Figures 5.8 and 5.9 present the attention and tone of the *Denver Post*'s coverage of the Rocky Flats facility. Figure 5.8 presents an overview of the total coverage given to Rocky Flats during the period 1979-1985. The figure illustrates the fact that Rocky Flats was constantly in the news during this period, averaging over 45 stories per year. The high points between 1976 and 1980 indicate a time of extensive coverage of issues at the plant due, in part, to the work of the Rocky Flats Citizens Panel created by Governor Richard Lamm and Senator Timothy Wirth in 1975. In addition, 1978 was the first year where protests at the plant were major events involving thousands of people rather than small gatherings of concerned individuals and groups. During this period there was also a great deal of coverage about competing occupational health studies, worker death litigation, and an acrimonious debate over converting Rocky Flats to non-nuclear activities.

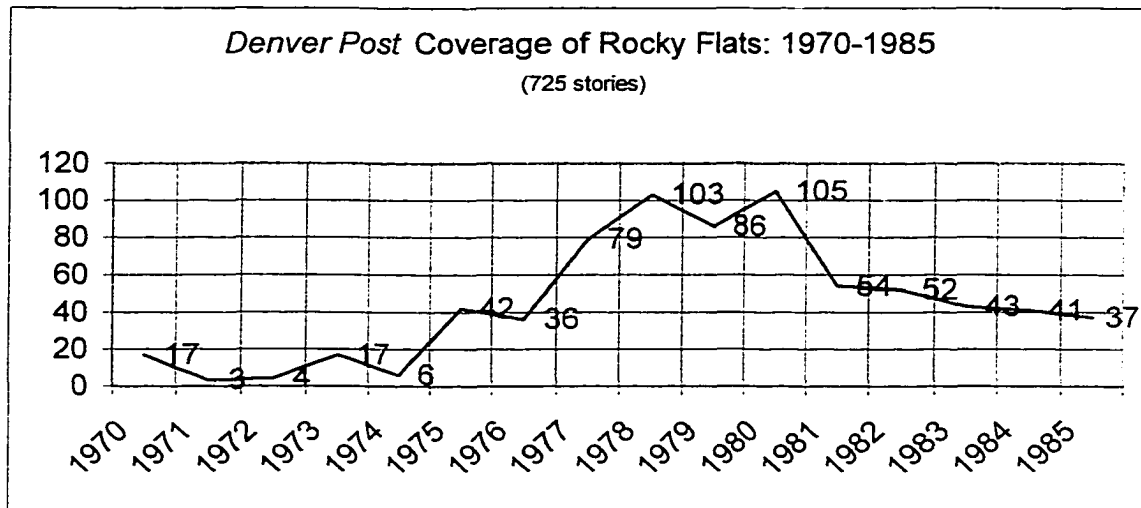


Figure 5.8: *Denver Post* Attention, 1970-1985

As illustrated in Figure 5.9, the tone of *Denver Post* coverage of the Rocky Flats facility was primarily negative. This was due to a series of accidents and mishaps at the plant, coupled with the nature of the environmental, safety and health issues at the facility. After the highly publicized 1969 fire, the majority of local attention was focused on the environmental contamination and public health implications of Rocky Flats, in particular, the cancer risks associated with working at or living near the plant. In addition, protests and demonstrations at the facility grew in frequency and size through the 1970s and were used as a means for policy reformers to present their opposition views of nuclear weapons production issues. Moreover, an acrimonious debate emerged between and among federal, state and local entities over the true extent of radiation exposure health risks to plant workers and citizens living in proximity to the plant.

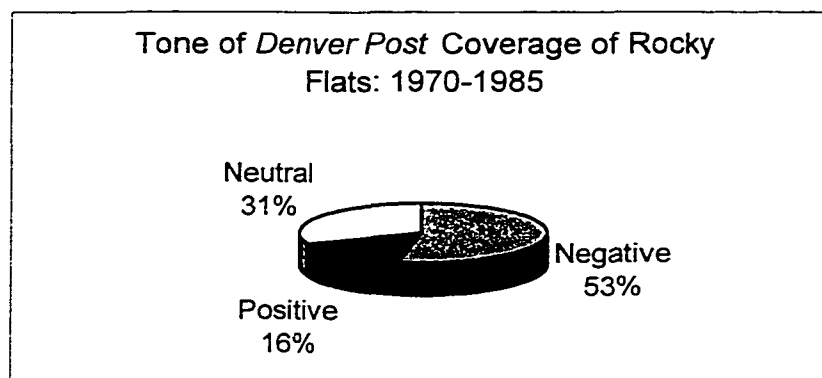


Figure 5.9: *Denver Post* Tone, 1970-1985

Figures 5.10 and 5.11 present the content analyses from the *Cincinnati Enquirer*. Figure 5.10 illustrates that the Fernald facility was rarely a news item until 1984. Aside from stories about new contracts at the plant and a small handful of labor issues, the Fernald facility was simply not a significant news item until a 1984 accident involving a large release of uranium dust. The coverage expanded considerably after the accident as more information about the plant's operations became public knowledge. In particular, investigative reporting revealed a long and secret history of accidents involving radioactive and toxic substances at the facility. A handful of local area residents formed Fernald Residents for Environment Safety and Health (FRESH) and in 1985 the group launched a class-action lawsuit against National Lead of Ohio, the government's prime contractor at the facility, under the Federal Tort Claims Act.

By 1985 the Fernald facility had become the subject of attention of both the State of Ohio and the Federal government. The Ohio Environmental Protection Agency initiated a series of environmental analyses on the soil and water near the facility and discovered a number of contaminated areas, including wells that registered high levels of

radioactive and hazardous chemical contamination. Ohio state government officials threatened litigation over the contamination and called for changes in the oversight of the facility. Meanwhile, Ohio Senators John Glenn and Howard Metzenbaum, along with local representative Gerald Luken, initiated investigations of DOE operations at Fernald. Glenn convened hearings of the Senate Government Affairs Committee, of which he was chair, to examine the environmental, safety and health issues at the facility. Glenn raised pointed questions about the DOE's self-regulation of mixed and radioactive waste materials at Fernald arguing that the agency's policy was both inadequate, presumptuous and in need of change (U.S. Congress 1985a).

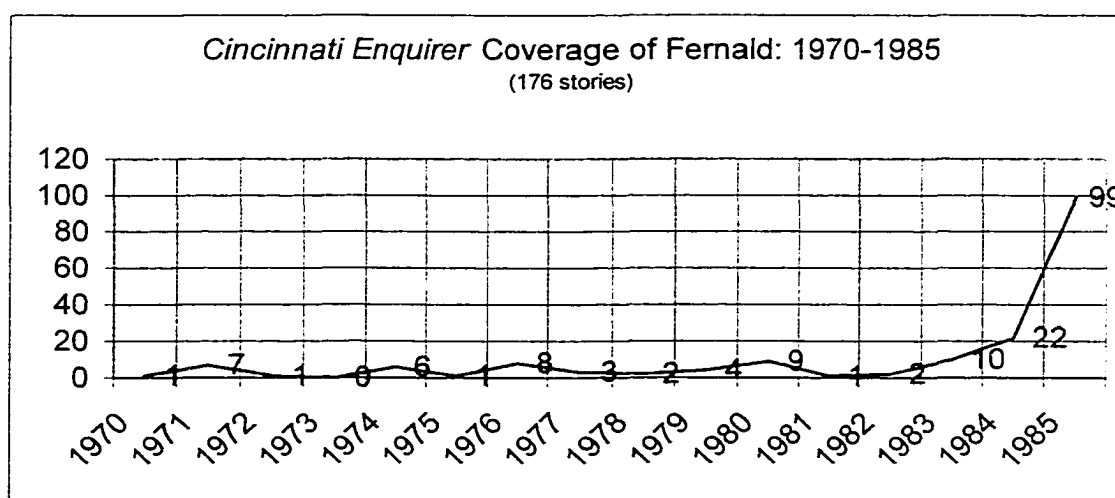


Figure 5.10: *Cincinnati Enquirer* Attention, 1970-1985

Figure 5.11 illustrates the tone of *Enquirer* coverage during 1970-1985. Much like the tone of the *Denver Post*, the majority of Fernald coverage was negative. Most of the coverage during 1984-1985 concerned the uranium dust release and the subsequent revelation of widespread problems at the facility. Investigations by the State of Ohio and the federal government in 1985 were key mechanisms for shedding light on the problems

at Fernald and garnered substantial media coverage. Moreover, grassroots-based litigation over uranium contamination, coupled with a handful of occupational death litigation cases, contributed to an overwhelmingly negative tone of media attention.

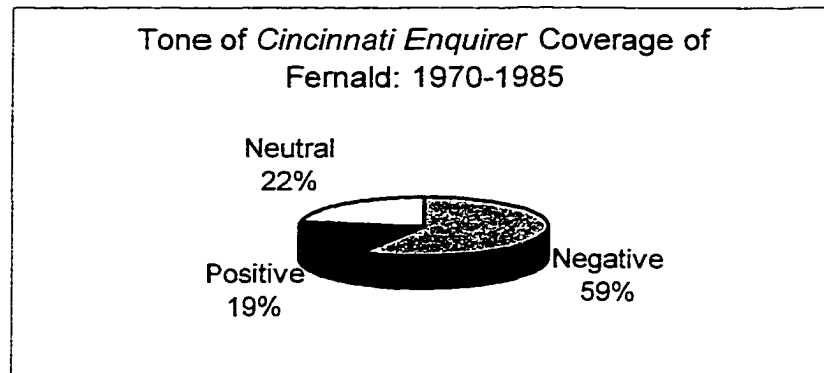


Figure 5.11: *Cincinnati Enquirer* Tone, 1970-1985

Figures 5.12 and 5.13 present the attention and tone of the *Seattle Times*' coverage of the Hanford Reservation from 1970-1985. In general, the *Seattle Times* coverage was characterized by a cyclical pattern with attention peaking during the 1973 radioactive waste leak accident, the 1978-79 controversy over the Mancuso controversy, and the 1985 release of information about long-time radiation leaks at the reservation coupled with the DOE's plan to test area residents for past radiation exposure. Aside from those high profile stories, attention to Hanford was minimal and focused mostly on routine operational matters during the 1970-1985 period. While only speculative, the minimal attention focused on Hanford Reservation may have resulted from the facility's proximity to the Seattle area.

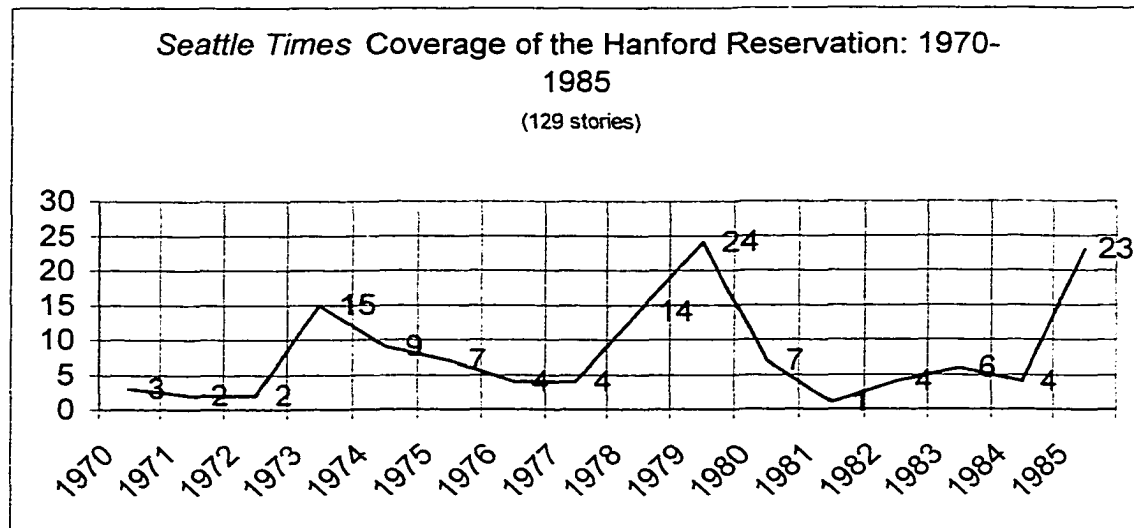


Figure 5.12: *Seattle Times* Attention, 1970-1985

Figure 5.13 illustrates the tone of coverage found in the *Seattle Times* coverage of the Hanford Reservation. Much like the tone found in the national and local media sources illustrated above, the majority of stories were negative. Although attention to Hanford was limited, the stories covering accidents at the Hanford Reservation, coupled with the health controversies surrounding facility operations, were primarily of a negative tone.

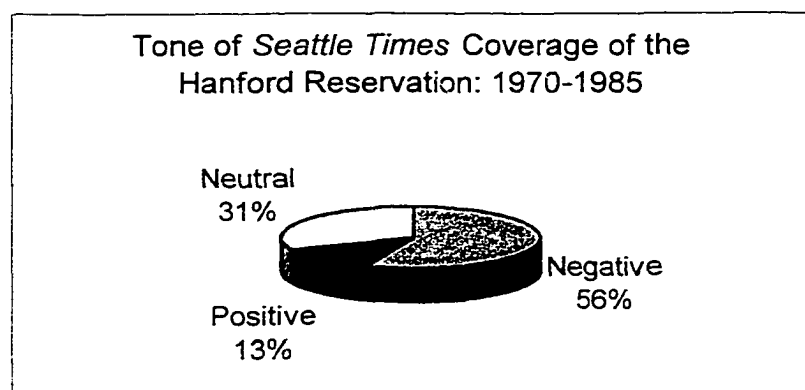


Figure 5.13: *Seattle Times* Tone, 1970-1985

The above figures illustrating national and local media attention and tone clearly indicate differences across media sources in terms of the overall attention to nuclear weapons production policy. This difference is particularly apparent across the local media sources. Yet one clear pattern in every media source reported in this section is the negative tone of attention. In fact, in each of the five media sources, more stories were coded neutral than positive. Given the nature of the news concerning nuclear weapons production policy (i.e., accidents, mishaps, and health concerns) the tone of coverage should be no surprise. The environmental, safety and health news about nuclear weapons production policy was characterized in media coverage as threatening and risky, even when there was little clear connection between contamination and pollution problems and immanent danger to human health and the environment. Nevertheless, the content analyses illustrated here clearly indicate an overwhelmingly negative image of nuclear weapons production policy during the period 1970-1985. Until accidents and mishaps began to accumulate after 1970, there were few times when the news about nuclear weapons production policy could have been positive because the veil of secrecy effectively shrouded production operations and policy. For the most part, there simply was little news other than stories about accidents and mishaps involving radioactive and hazardous materials.

State Government Venues, 1970-1985

Generally speaking, state governments emerged slowly as players in nuclear weapons production policy. The primary reason for this slow development was that nuclear weapons production was the exclusive policy domain of the federal government. As we

saw in chapter 4, state governments were simply not players under the Atomic Energy Act of 1946 or its subsequent amendments. In addition, the veil of secrecy surrounding weapons production facilities kept many state and local governments from knowing the full extent of those activities. While the accidents and events in the weapons production complex were potentially serious, they were essentially local events that were not interpreted in the media as a systemic problem. Moreover, the fact that nuclear weapons production policy served as a substantial economic engine for communities in proximity to the weapons facilities likely made both state and local governments reluctant to directly challenge the operations (Gerber 1992, Lanouette 1990).

Although state and local governments had little latitude to initiate policy change they were not passive particularly as the environmental, safety and health problems besetting the weapons production complex became public knowledge. In reviewing state government action between 1970 and 1985 an important idea emerged early and gradually gained momentum: the need for federal facility compliance and the ability of states to exert their own regulatory authority. On the occasions when state government actors exerted effort in the direction of policy change those efforts were primarily aimed at compelling federal facilities to abide by federal and state ES&H regulations. This was a particularly challenging feat given the self-regulatory nature of the policy monopoly coupled with its national security mission.

Table 5.7 provides an overview of state-level venue succession events. As the table indicates, the actions undertaken by state and local government were varied and included litigation, analysis and advocacy. Although not included here, a handful of local ordinances were also passed, but these were mostly symbolic in nature because they had no weight of

authority to compel action by the federal government. It is important to keep in mind that while examples of state venue succession are limited, there was an unmistakable movement by state governments toward compelling federal facility compliance with environmental, safety and health regulations. Perhaps more importantly, despite the limits on state governments to initiate policy change, their actions were a reflection of the negative images that increasingly characterized nuclear weapons production policy.

Table 5.7: State-Level Venue Succession Events

Year	State-Level Venue Succession Events
1971	Washington Governor's Task Force studies Hanford reactor safety/contamination operations
1971	Colorado Dept. of Health begins first health-effects analysis of Rocky Flats area
1974	Jefferson County Health Director Dr. Carl Johnson begins analysis of plutonium in soils near Rocky Flats
1974	Fourteen State Attorney's General file amicus briefs in COPIRG v. Train over federal facility compliance with environmental regulations
1974	Washington State Department of Health analysis finds excess cancers among Hanford workforce compared to other occupational groups
1975	Colorado sues Federal government and Rockwell International under Federal Tort Claims Act for land devaluation near Rocky Flats
1975	Citizen Panel created by Governor Richard Lamm and Senator Timothy Wirth to study Rocky Flats closure/conversion issues
1976	Lamm-Wirth Panel recommends Rocky Flats conversion to non-nuclear operations
1977	University of California Weapons Lab Conversion proposal first introduced in California Legislature
1978	Colorado Courts begin to hear Rocky Flats occupational death cases
1978	Tennessee Department of Health & Environment refuses to certify water discharge permits for the DOE's Oak Ridge facility
1979	California legislature rejects Gov. Brown's request for Lawrence Livermore Lab conversion study
1979	Idaho Governor's office produces third study of nuclear waste pollution at INEL; threatens litigation
1982	Ohio EPA tests well water near Fernald site; results are mixed
1982	South Carolina joins Natural Resources Defense Council suit over Savannah River reactor restart proposal
1982	Colorado voters reject Amendment 6, a tax to study Rocky Flats conversion
1982	Ohio courts begin to hear Fernald occupational death cases
1983	Tennessee joins Legal Environmental Assistance Fund/NRDC suit over hazardous waste at the Oak Ridge facility
1985	Washington voters approve Referendum 40, opposing the Hanford Reservation as a high level nuclear waste dump

Complicating the efforts of state governments were two fairly obscure structural features that were not ostensibly related to the nuclear weapons production policy monopoly, but which, nevertheless served to insulate the policy. In what was likely a reaction to the growing controversies surrounding problems in the weapons complex, and increasingly contentious state governments, the Reagan administration utilized the doctrine of sovereign immunity as an obstacle to state-level environmental regulation enforcement actions against federal agencies (Finnamore 1984). Essentially, sovereign immunity is a doctrine that acts to insulate federal government agencies from litigation and financial responsibility unless Congress specifically waives that immunity for particular government activities or agencies (Wolverton 1991). While the doctrine did not prevent state governments from filing suit against the Department of Energy, the precedent for success would not be achieved until Congress acted to waive sovereign immunity for the DOE in 1992. This will be examined in greater detail in chapter 6.

A second structural feature that frustrated state efforts to compel federal facility compliance was the unitary executive principle, which is essentially the idea that the executive branch cannot sue itself. In the midst of the controversy surrounding the planned reopening of nuclear reactors at the Savannah River site in 1982-3, the Justice Department issued a ruling that essentially prevented the Environmental Protection Agency from enforcing administrative compliance orders against the DOE, or filing suit against the DOE for environmental, safety or health compliance violations. State governments were beginning to argue that federal agencies, namely the DOE, must comply with sanctions imposed by courts or other federal agencies in order to uphold environmental, safety and health regulations. Moreover, these groups argued, the EPA

should exercise its enforcement powers in compelling DOE compliance. Without explicit authorization from Congress, the Justice Department position stated, EPA enforcement efforts against DOE would be restricted to persuasion and negotiation, formalized through compliance and consent agreements (Dycus 1996, Wolverton 1991). In short, state governments, lacking their own statutory powers to ensure environmental compliance at federal facilities, were also unable to rely on the EPA to serve as an enforcement institution at the federal level. Nevertheless, as Table 5.7 illustrates, state governments which hosted elements of the nuclear weapons production complex were active in either raising their awareness of ES&H problems, or were taking limited measures to initiate policy change.

Organized Opposition

Changing images of nuclear weapons production policy at both national and local levels was an important factor in the emergence of organized opposition. An interesting note is that national groups formed as a result of no particular event or incident whereas some grassroots organizations emerged in the immediate aftermath of accidents at particular weapons production sites. Groups formed as a result of changing images, and also played a central role in fostering image change.

Table 5.8 lists grassroots and national organizations according to when they were identified as being active in nuclear weapons production policy, their primary issue concerns, and their policy reform tactics. The list includes only those organizations that were active for an extended period of time (i.e., identified at several points between 1970 and 1985) rather than those organized for a single demonstration, quickly faded away or

merged with other groups. Numerous grassroots organizations found in the content analysis of local media sources that were not identified a second time, were nevertheless were involved in activities aimed at policy reform.

Table 5.8: Policy Reformers and Nuclear Weapons Production Policy

Grassroots Organizations: Concerns & Tactics	National Organizations: Concerns & Tactics
CO Cmte. For Environmental Info (1968); <i>ES&H; A, Ad</i> Citizens Concerned About Radiation Pollution (1969); <i>ES&H; Ad</i> Oregon Env. Council (1973); <i>ES&H; Ad, L</i> Colorado Public Interest Research Group (1974); <i>ES&H; Ad, L</i> Citizen Alert (1975); <i>ES&H; Ad</i> University of California Nuclear Weapons Lab Conversion Project (1977); <i>ES&H; Ad</i> Snake River Alliance (1978); <i>ES&H; Ad</i> Energy Research Foundation (1982); <i>ES&H; Ad</i> Coastal Citizens for Clean Energy (1982); <i>ES&H; Ad</i> Clergy and Laity Concerned (1982); <i>P-D; Ad</i> Panhandle Env. Cmte. (1982); <i>ES&H; Ad</i> Rocky Flats/Nuclear Weapons Facilities Project (1982); <i>ES&H; Ad</i> South Carolina Wildlife Federation (1983); <i>ES&H; Ad</i> Athenians for Clean Energy (1983); <i>ES&H; Ad</i> Georgia Conservancy (1983); <i>ES&H; Ad</i> Georgians Against Nuclear Energy (1983); <i>ES&H; Ad</i> Tri-Valley CAREs (1983); <i>ES&H; Ad</i> Hanford Education Action League (1983); <i>ES&H; Ad</i> Rocky Mountain Peace & Justice Ctr. (1983); <i>P-D; Ad, C</i> Palmetto Alliance (1983); <i>ES&H; Ad</i> FRESH (1984); <i>ES&H; Ad, L</i> Heart of American Northwest (1984) <i>ES&H; Ad</i> Miamisburg ES&H (1985); <i>ES&H; Ad</i> Hanford Oversight Cmte. (1985); <i>ES&H; Ad</i> Hanford Clearinghouse (1985); <i>ES&H; Ad</i>	Natural Resources Defense Council (1972); <i>ES&H, AC; Ad, A, C, L</i> Union of Concerned Scientists (1973); <i>ES&H, AC; A, Ad</i> Friends of the Earth (1973); <i>ES&H; Ad</i> Government Accountability Project (1976); <i>ES&H; Ad, C</i> Sierra Club (1974); <i>ES&H; A, Ad, C, L</i> Common Cause (1976); <i>ES&H; A, Ad</i> US Nuclear Weapons Labs Conversion Project (1976); <i>P-D; Ad</i> SANE (1978); <i>P-D; Ad</i> Mobilization for Survival (1978); <i>ES&H, P-D; Ad, C, P</i> Environmental Policy Center (1978); <i>ES&H; A, Ad</i> Fellowship of Reconciliation (1978); <i>ES&H, P-D; Ad</i> Environmental Policy Institute (1978); <i>ES&H; A, Ad</i> Citizens Against a Radioactive Environment (1980); <i>ES&H, Ad</i> Federation of American Scientists (1981); <i>AC; A, Ad</i> Nuclear Control Institute (1981); <i>AC; A, Ad</i> Nuclear Club (1981); <i>AC; Ad</i> Legal Environmental. Assistance Fund (1982); <i>ES&H; C, L</i> League of Women Voters (1983); <i>ES&H; Ad</i> Physicians for Social Responsibility (1983); <i>ES&H, P-D; Ad</i> American Academy of Pediatrics (1983); <i>ES&H; Ad</i> National Wildlife Federation (1983); <i>ES&H; Ad</i>

Key: (1968) indicates the year group is identified in nuclear weapons production policy reform efforts. Chief concerns: *ES&H* = environmental, safety & health; *P-D* = peace-disarmament; *AC* = arms control. Tactics: *Ad* = advocacy (testimony, education), *A* = analysis (studies and reports), *C* = coalition building (creating and maintaining working relationships with other groups); *L* = litigation (suits or threats of suits), *P* = protest (rallies, demonstrations).

Table 5.8 illustrates that there were essentially three major concerns of the organized opposition that intersected at nuclear weapons production policy. One concern was over the environmental, safety and health threats associated with nuclear weapons production. These concerns emerged early and were rooted in the concerns expressed over the health and environmental effects of exposure to radiation. These concerns were intensified as information about the contamination problems in the weapons complex gradually became public knowledge and as the seriousness of the health consequences of radiation exposure became better understood. Groups that focused on the environmental, safety and health implications of nuclear weapons production did so in a way that also raised questions about government accountability. Much like state and local governments, environmental, safety and health-oriented organizations argued that federal facilities involved in the production of nuclear weapons should abide by the same regulations that applied to society at large. According to these groups, self-regulation, a pillar of the weapons production policy monopoly, had given the AEC and the DOE carte blanche to disregard the environmental, safety and health consequences of production (Crawford interview 1999, Gottlieb 1993, Rogers interview 1999).

A second general area of concern focused on the moral and ethical implications of nuclear weapons. Peace and disarmament-oriented groups viewed nuclear weapons as immoral instruments of military power because of their ability to destroy whole societies and indiscriminately kill civilians as well as military personnel (Szegedy-Maszak 1989). These concerns were also rooted in the early years of the nuclear age and were first expressed by some of the very scientists who invented nuclear weapons (Rhodes 1986, 1995). Groups concerned with the global environmental implications of nuclear warfare,

specifically the concept of “nuclear winter” were among this disparate set of weapons production opponents. For these groups, which included clergy, peace protestors from the Vietnam era and some of the world’s eminent scientists, halting nuclear weapons production represented the most straightforward means of ensuring that their power would never be unleashed (Gottlieb 1993).

A third concern of policy reform groups focused specifically on the military implications of nuclear weapons, particularly how nuclear weapons shaped relations between the U.S. and the Soviet Union. Proponents of nuclear arms control were motivated less by the environmental and ethical implications of nuclear weapons production than they were about a desire to perpetuate superpower détente and reduce the dangers of nuclear confrontation. The nuclear arms race of the 1950s and 1960s had spawned a small, but influential group of scientific and military experts who advocated negotiated measures to control the expansion of nuclear arsenals (Freedman 1986). Although the idea was rooted in the early Cold War years, nuclear arms control made little significant progress until the 1960s when a framework for superpower dialogue was institutionalized. The idea was energized by the Comprehensive Test Ban Treaty of 1963, followed by the two phases of the Strategic Arms Limitation Treaty (SALT I & II) negotiations from the late 1960s to 1980, and supplemented by the Anti-Ballistic Missile Treaty of 1973.

Far more than individuals in peace and disarmament groups, arms control proponents could rarely be dismissed as uninformed cranks or Soviet sympathizers. This was especially the case as the ranks of the arms control community swelled with former government officials who had participated in arms control negotiations, served in the

armed forces, or been involved in nuclear weapons research and development (Herken 1986, York 1987). Moreover, unlike advocates of disarmament, arms control proponents rarely based their arguments on moral or ethical principles. Rather, they saw nuclear weapons as an unfortunate reality that nevertheless served as an important component of the U.S. national security posture. Because their focus was not exclusively on the moral implications of nuclear weapons, the views of arms control advocates were often better received by important political venues, particularly in Congress (Gottlieb 1993, Herken 1985). At varying times, the idea of arms control focused on limiting the numbers of nuclear weapons, restricting the development and deployment of strategic weapons systems, and placing restrictions on the production of nuclear weapons materials. It was this final concern that was focused specifically on nuclear weapons production policy.

Finally, arms control proponents were active primarily inside the Beltway where their access to key decision makers in Washington made networking an effective approach to policy reform. These groups were able to approach nuclear weapons production policy from the perspective that national security would actually be increased by reducing the production of nuclear materials such as plutonium, tritium and enriched uranium. In this respect, arms control groups were reviving an idea which had first been articulated in 1946 under the Baruch Plan, which envisioned an international nuclear materials control regime, but had not obtained widespread support in the intervening years (Lanouette 1989, Szegedy-Maszak 1989).

Although the three major concerns often overlapped they were emphasized differently across the weapons complex. Interviews with grassroots organizations reveal that many groups focused exclusively on environmental, safety and health issues and

chose to exclude the moral and ethical dimensions of nuclear weapons production. Realizing that opposition based on the moral and ethical considerations of nuclear weapons production might not attract support from a conservative local citizenry, particularly if jobs were on the line, grassroots groups at Fernald, Hanford and Savannah River emphasized the more tangible environmental, safety and health issues (Banfield e-mail 1998, Crawford interview 1999, Gerber 1992, Rogers interview 1999).

The situation at Rocky Flats and the Lawrence Livermore Laboratory, however, was somewhat different where both peace and health and environment-oriented concerns were advocated by groups (Kelly, e-mail 1998). The proximity of the University of Colorado and University of California-Berkeley, which were centers of peace protest activity, was undoubtedly a factor in the orientation of these twin concerns. More politically conservative locations, such as the region surrounding the Hanford Reservation, rarely saw the development or activity of peace-oriented groups. Even strictly environmental concerns, such as pollution of the Columbia River, were seen as less persuasive than the health-related issues associated with weapons production (Gerber 1992).

Shifting Support: Labor Unions and Contractors

Importantly, the groups that focused on environmental, safety and health issues were also able to gradually obtain the support of labor unions. Once the health and safety risks to the weapons complex workforce emerged into the public sphere, labor unions were seen as likely allies in the effort to bring about change (Crawford, interview 1999). Union membership became wary of the safety assurances of the federal government when

the first longitudinal studies were released during the mid-1970s and as the Department of Energy initiated an effort to study the effects of plutonium exposure on workers at Rocky Flats in 1978. As the health risks to the nuclear labor force became part of the national political agenda in the late 1970s (during Congressional hearings and the creation of a presidential advisory panel) organizations such as the Oil, Chemical and Atomic Workers Union (OCAWU), and the Atomic Trades and Labor Council (ATLC), began to alter their positions (U.S. Congress 1985). The OCAWU and the ATLC had been strong, if silent, proponents of weapons production policy, but once the nature of the health risks of radiation exposure became better known, this support began to erode. In 1979, the OCAWU was the first labor organization to call on Congress to transfer DOE's health-related authority to another federal agency because of allegations that DOE officials had tried to cover up findings about cancer risks. Other local union organizations representing nuclear workers gradually took a similar position. Union support for nuclear weapons production policy continued to slip during the early 1980s as more information about radiation exposure became public knowledge, and as the controversy surrounding production activities grew increasingly negative. Congressional response to organized labor opposition was manifest in a 1985 debate in both House and Senate over the Radiation Research Reorganization Act (RRRA), a proposal to transfer DOE's health-related authority to the Department of Health and Human Services (U.S. Congress 1985a, 1985c). Although the RRRA did not reach the floor of either House or Senate, the debate was an indication that union concerns had, once again, helped place the radiation and health issue on the congressional agenda.

It is important to also mention the gradual weakening of support by the contractors that were involved in the day-to-day operations of the nuclear weapons production complex. The government's contractors grew increasingly wary of the weapons production work particularly as operating nuclear weapons facilities became a public relations liability. The formerly solid, yet silent support of Dow Chemical, du Pont, Monsanto, Rockwell International, and other corporate giants, softened as the perception of the public and company shareholders began to change in the early 1980s, and as occupational litigation directed against them mounted (Chavez 1982, Lavelle 1989). Contractors did not become proponents of policy reform, nor was their behavior oriented toward initiating policy changes as envisioned by environmental, safety and health advocates. Nevertheless, contractors found themselves increasingly on the defensive in the public sphere and discovered that the DOE was often willing to affix blame on contractor activities rather than defend their practices or accept responsibility for management shortcomings (Chavez 1982, Gillette 1973). Despite turnover of prime contractors at Rocky Flats in 1975, Oak Ridge in 1982, and Fernald in 1985, the environmental, safety and health controversy persisted. By the mid-1980s, the government-contractor relationship was showing signs of serious strain.

Stimulating the Opposition: Modernizing and Expanding the Nuclear Arsenal

In addition to the accidents and mishaps in the production complex from 1970-1985, the decision by the Carter and Reagan administrations to expand and modernize the U.S. nuclear arsenal was a critical factor in energizing all three major concerns of opposition organizations. At the center of the modernization plan was the need to expand nuclear materials production, specifically plutonium, which required the restart of three

Savannah River reactors on cold standby, as well as the construction of two new production reactors (Smith 1981, Sun 1981). In the effort to expand materials production, the Reagan administration also floated a proposal in 1981, calling for the extraction of plutonium from the spent fuel of commercial power reactors (Norman 1981). In addition, the Reagan administration also proposed purchasing a partially completed reactor that was part of the nearly bankrupt Washington Public Power Supply System. Under the proposal, the WPPSS reactor would be altered to produce plutonium for nuclear weapons (Miller 1982, Wald 1987).

The modernization/expansion proposals of 1980-81 proved to be critical for policy change for several important reasons. First, the plan to restart production reactors meant that the DOE faced the prospect of upgrading facilities that had been on cold standby for well over a decade. Opposition organizations saw the reactor restart plan as an opportunity to test their past success in the courts where they had successfully argued that some weapons production operations should be subject to the environmental impact statement (EIS) requirements of NEPA (Holt 1990). Although the EIS precedent existed in nuclear weapons production policy, the DOE was reluctant to produce a formal EIS for the Savannah River reactor restart asserting that the environmental impact of the plan would be minimal. DOE's less formal environmental review analysis raised concerns not simply for its brevity, but also for its characterization of the impacts as minimal. A handful of grassroots organizations made it clear that they mistrusted the DOE's analysis and objectivity in the case (Charles 1988, Rogers interview 1999). The conflict over the Savannah River reactor restart quickly evolved into a full-blown crisis for the DOE both in Washington D.C. and in South Carolina where the state's Senate delegation of Strom

Thurmond and Ernest Hollings pushed DOE to produce a formal environmental impact statement (Horan 1988).

The Savannah River reactor restart conflict also prompted a congressional investigation into the EPA's role in the controversy (Horan 1988). EPA administrator Anne Burford had accepted the DOE's position on the EIS issue, and the nature of the projected environmental impact, despite concerns to the contrary expressed by the EPA field office in Atlanta, the U.S. Fish and Wildlife Service, the Council on Environmental Quality, and the South Carolina Coastal Council, a state agency (Smith 1982, 1983, Norman 1983, 1984). The conflict was eventually resolved in federal court in 1983 with a directive to DOE to produce the formal EIS (see Table 5.9, *NRDC v. Vaughn*).

Second, the proposals to recycle spent power reactor fuel and purchase the unfinished WPPSS commercial nuclear reactor appeared to some to contradict the time honored distinction between U.S. military and civilian nuclear programs (Miller 1982, Wald 1987). Choosing not to reprocess spent reactor fuel for military purposes had served as a pillar of U.S. nonproliferation policy and was codified in the Non Proliferation Act of 1978 which placed strict limitations on the export of technology or expertise which could be used for such purposes (Walsh 1978). In addition, no U.S. administration had ever publicly proposed converting a commercial power reactor to military purposes, preferring to maintain a strict policy that had been established during the Eisenhower administration. Opponents were quick to point out the potential ramifications of blurring the civilian-military distinction and argued that global nuclear weapons nonproliferation policy efforts could be seriously compromised if the Reagan administration embarked on the fuel recycling and commercial power reactor conversion

proposals. Opposition inside the Beltway was vocal and well connected. The mainstream arms control community condemned the proposals and launched a vigorous lobbying effort to block legislation (Sun 1981). Some members of Congress demonstrated their opposition when bills sponsored by Senator Gary Hart (D-CO) and Representative Edward Markey (D-MA), which forbade spent fuel reprocessing, were attached to the FY 1982 reauthorization bill for the Nuclear Regulatory Commission (Norman 1981). Although the Reagan administration threatened a veto of the legislation, it eventually backed away from the controversy by shelving the reprocessing plan (CQ Almanac 1982).

Third, when the Carter and Reagan administrations embarked on nuclear arsenal modernization plans the key issue raised by opponents was the true nature of the nation's plutonium needs. Although two government studies had concluded in 1979 that shortages of nuclear materials created a "serious concern to...national security interests," arms control advocates openly questioned this conclusion arguing that recycling plutonium from retired weapons could easily fill the perceived materials needs (Sun 1981, 146). Moreover, these groups pointed to statements made by government officials who had described the U.S. as "awash in plutonium," seemingly undercutting the threat of nuclear materials shortages (Sun 1981, 146, 147). This argument appealed to particular members of Congress who also held reservations about the weapons modernization plan because of cost issues associated with restarting old reactors and building new ones, and the possible impact on arms control negotiations with the Soviet Union (Albright and Paine 1988, Sun 1981).

Finally, the nuclear arms modernization and expansion programs taxed an already overworked and obsolete weapons production infrastructure. Since their initial construction, few of the facilities had received any comprehensive technological upgrades, either in production processes or waste management equipment and techniques. The sudden increase in production operations proved problematic for some key elements of the weapons complex and led to a handful of high profile mishaps and accidents (OTA 1991). The controversial discovery of widespread mercury pollution at the Oak Ridge facility, for example, was evidence to opponents that the weapons production complex was operating without modern waste abatement and treatment technology and increasingly creating potentially serious environmental and public health problems. The fact that the Oak Ridge mercury pollution was a well known to the DOE, and that the agency had disciplined several of its scientists for examining the problem in greater detail, only exacerbated the public relations issue and served as a wedge between the agency and some important members of Congress (Marshall 1983, U.S. Congress 1983). More generally, the Oak Ridge controversy contributed to a negative image of weapons production policy and government credibility.

Opposition Tactics

The groups opposed to nuclear weapons production policy were able to effectively employ a handful of tactics that were to have an important impact on policy change. As illustrated in Table 5.8, five general tactics were identified from the available evidence: advocacy (testimony, sponsoring ballot issues, education campaigns); analysis (production of reports and analysis); coalition-building (working with other groups);

litigation (actual or threats of legal action); and protest. As the table indicates, some groups were involved in utilizing multiple tactics in pressing for reform.

Not surprisingly, success differed across tactics. Protests and demonstrations, for example, were effective at gaining media attention at specific nuclear weapons production sites, but could be (and were) easily ignored by the AEC, and later the DOE, which rarely issued official responses to such activities. Moreover, peace and disarmament protests were more common at weapons production sites located near politically active college campuses such as the University of Colorado and the University of California at Berkeley. By contrast, content analysis of local media sources indicated that the Fernald and Hanford sites were the location of an exceedingly small number of protests.

The Impact of Health Analyses on Policy Images

A second type of publicity was the production of studies and analyses that focused on environmental, safety and health problems in the nuclear weapons production complex. This information presented a much more damaging type of publicity for nuclear weapons production policy and was particularly effective in conflict expansion. Studies usually brought to light information that contradicted the official pronouncements of the AEC/DOE, particularly with regards to the potential hazards and risks to public health and the environment. Moreover, the release of analysis about AEC/DOE operations usually prompted some sort of response from the agency and allowed opponents the opportunity to link related issues such as contamination, safety and accountability. Moreover, reports produced by organizations with members possessing

scientific and/or professional credibility usually gained the attention of the media and important policy venues and therefore served as vehicles for conflict expansion.

The activities of the Colorado Committee for Environmental Information (CCEI) were typical. In the aftermath of the May 1969 fire at the Rocky Flats facility, the CCEI requested that the AEC conduct a study on the possible contaminants in the Denver area. When the AEC demurred, the CCEI conducted its own analysis. Soil samples taken from areas downwind from Rocky Flats indicated high levels of plutonium and radioactive cesium, levels which, according to the CCEI, were higher than those found in soils near the Nevada Test Site. Although the AEC criticized the methods of the CCEI study, it admitted that releases of radioactive materials had occurred, but that those levels were too small to represent a hazard to public health or the environment. Despite the official AEC pronouncements, the CCEI analysis was effective enough to compel the Colorado Department of Health to conduct a more comprehensive analysis of its own.

Other analyses, particularly those concerned with the health and safety of the nuclear complex workforce, proved to be important for reshaping the image of the policy. Despite the fact that the workforce health studies were not produced by reform proponents, the reports were seized upon as evidence of the serious threats posed by working with low-level ionizing radiation. Moreover, the government's response to the health-analyses heightened the controversy and appeared to exhibit signs of cover up and deception concerning the occupational health risks of nuclear weapons production activities.

The Mancuso Controversy

In what was undoubtedly the most controversial case of radiation and occupational health of nuclear weapons production policy, Dr. Thomas Mancuso, a physician from the University of Pittsburgh, and Alice Stewart, a British epidemiologist, produced a controversial longitudinal health and mortality analysis of Hanford Reservation workers (Wasserman and Soloman 1982). Mancuso had been contracted by the AEC in 1964 to conduct the study after internal deliberations by the Commission determined that exposure to low level radiation at the weapons complex deserved detailed and comprehensive analysis. By 1976, Mancuso had assembled the first preliminary findings indicating that Hanford Reservation worker's exposure to radiation levels considered safe by government standards, were experiencing elevated cancer rates. The Mancuso study paralleled findings from a 1974 report of occupational deaths by Dr. Sam Milham of the University of Washington. Financed by the National Institute of Occupational Health and Safety, Milham's report indicated that there appeared to be more deaths from cancer among Hanford workers than would be expected.

The controversy over weapons complex worker health was particularly sensitive for the government because it appeared to confirm the concerns held by AEC scientists in the 1960s that radiation exposure standards were too high, and corroborated the theory that there was no safe level of radiation exposure. Complicating matters was the government's reaction to the Mancuso findings. After initially pressing Mancuso to release what was believed to be results that indicated no unusual health threat, the AEC/DOE worked to prevent the release of his preliminary findings when his analysis appeared to reveal a higher cancer rate for Hanford workers. Moreover, the AEC/DOE

prevented Mancuso from accessing his own data, and unceremoniously terminated his research contract in 1977 as he was in the final stages of the analysis. In addition, the fact that the government transferred Mancuso's research contract to the Oak Ridge Associated Universities, an academic research consortium directly affiliated with nuclear weapons research and development, raised serious questions about the objectivity of the entire process. To many opponents it appeared that the government was attempting to hide potentially damaging information. The controversy ultimately found its way to Congress where hearings were held in 1978 to probe the government's handling of the case and examine the larger political issues of radiation and health in military-related production activities (Connor 1990, U.S. Congress 1978, Wasserman and Soloman 1982).

The Emerging Image Problem

In terms of policy image, it is important to keep in mind that the Mancuso findings were not definitive. Like a number of other studies of occupational health and disease rates among plant workers and citizens living in proximity to weapons plants, it was very difficult to establish a clear causal relationship between exposure and cancer rates. At best, most studies suggested correlation rates that raised questions, but rarely provided unequivocal answers due to the presence of many other variables. The AEC/DOE and its contractors were quick to point out the inconclusive nature of these analyses and also raise questions about the accuracy of analytical methodologies employed. In terms of the impact on policy image, however, studies and information about risks associated with exposure to radiation or contamination was damaging to the notion that nuclear weapons production operations were safe. Although there was general agreement in the scientific community that radiation exposure should be minimized, there

was widespread disagreement about what constituted adequate safety levels (Culliton 1982, Lyone 1979, Sullivan 1979). Nevertheless, the public images associated with radiation exposure could hardly be described as anything but negative. Regardless of disagreement among scientific experts, radiation exposure was usually characterized by mutations, genetic defects, cancer, and similar assorted negative images. Once these images became part of the public vocabulary they became nearly impossible to change (Weart 1988).

The controversies swirling around weapons complex health analyses merely exacerbated a widening credibility gap in the management of nuclear weapons production policy. With each revelation of accidents, exposures and releases of toxic materials, the standard response by the AEC and DOE was that if a risk existed at all it was well within established safety standards. Yet this response quickly wore thin, particularly in the communities near complex facilities, because it became less reassuring as the number of problems multiplied and the government could not deny the existence of contamination. For example, in 1970 and again in 1973, the AEC acknowledged regular plutonium and tritium leaks at Rocky Flats, but argued that the amounts were too small to cause health concerns because they were below safety standards. In 1983, DOE officials revealed that 50 million pounds of hazardous materials had been buried at various locations at the Oak Ridge facility, but urged local residents not to be concerned because the material posed no health or safety hazard. Regardless of the government's claims of low health and safety risks, these images associated with radiation exposure and chemical contamination were extremely powerful and played a key role in the emergence of a negative image of nuclear weapons production policy.

The issue of worker health, combined with other concerns over radiation exposure, reached the political agenda of the federal government by 1978 when President Carter created the Interagency Radiation Task Force to assess the federal government's administration of radiation health issues. Among the panel's 1979 recommendations was the need for expanded analysis of radiation exposure and an overhaul of federal authority over radiation health. Specifically, the panel recommended that the Department of Energy's radiation health authority was misplaced due to the tension between the department's role as primary sponsor of research and its role as developer and promoter of nuclear technology (King 1979, Lyons 1979).

The Courts as Policy Battleground

One of the most potent policy reform tactics utilized by opponents of nuclear weapons production policy was litigation. Prior to the 1970s there were few avenues for policy reformers, of any particular interest, to access the judicial system. All this changed, however, with the emergence of the "environmental decade" of the 1970s. As we saw above, one important characteristic of environmental legislation beginning with the National Environmental Policy Act of 1969, was that the new laws contained a mechanism for legal recourse wherein concerned groups and individuals could turn to the judicial system to press their claims regarding environmental policy implementation.

As indicated in Table 5.9, litigation was a tactic successfully used by a number of groups pressing for reforms in nuclear weapons production policy. The cases presented here (Table 5.9) focused specifically on nuclear weapons production policy where the courts were utilized by policy reform proponents primarily to obtain compliance with

environmental, safety and health regulations. Although the number of cases was fairly small, it is important to keep in mind that they were part of a larger movement toward compelling compliance with regulatory structures and served as important precedent for future litigation.

Table 5.9: Nuclear Weapons Production Policy Litigation

Case	Subject and Outcome
NRDC v. AEC (1973)	Litigants desired to compel AEC to produce formal EIS for Hanford Reservation nuclear waste management plan. AEC agreed to produce study before case went to trial.
COPIRG v. Train (1974)	EPA authority to regulate radioactive discharges at the Rocky Flats facility. District Court ruled that EPA has authority. EPA appealed to Supreme Court which issued a 1976 ruling stating that EPA did not have authority over radioactive emissions. Atomic Energy Act gives AEC exclusive jurisdiction to regulate radioactive substances unless specifically waived by Congress.
Hancock v. Train (1976)	Supreme Court ruling that Kentucky did not have authority under the Clean Air Act to regulate the AEC gaseous diffusion facility at Paducah, KY. Without clear congressional intent to subject specific federal facilities to state regulatory control, states had no authority.
NRDC v. ERDA (1978)	Natural Resources Defense Council and other parties request environmental impact statement for high-level nuclear waste tank construction at Hanford. DOE ordered to produce EIS and complies with ruling.
U.S. v. State of Colorado (1978)	Supreme Court decision striking down Colorado taxation of lands adjacent to Rocky Flats. 1976 CO law directed a tax levy against Rockwell, prime contractor at the facility, to recoup financial losses from devalued lands near the plant.
NRDC v. Vaughn (1983)	NRDC and other parties request EIS for Savannah River restart. DOE argued restart would have no significant environmental impact. Court ordered DOE to comply with NEPA. DOE issued formal EIS.
Edwards v. National Lead of Ohio (1982)	Widow of Fernald worker sues NLO over wrongful death. Case eventually settled out of court.
Krumbach v. DOW Chemical (1983)	Case decided by Colorado Ct. of Appeals over damage award to widow of Rocky Flats worker. Original decision by CO Div. Of Labor was overturned by Industrial Cmsn. of Colorado which had excluded key testimony concerning radiation exposure hazards at Rocky Flats. CO Ct. of Appeals reinstated damage award by citing error of excluding important health evidence.

Johnson v. Jefferson County Board of Health (1983)	Johnson's decade-long analysis of radiation health issues near Rocky Flats had ended in his employment termination. CO Supreme Ct. ordered a review of Johnson's claim of unlawful dismissal from Jefferson Cty. Board of Health.
LEAF v. Hodel (1984)	LEAF and other parties argue that DOE's Oak Ridge operations must comply with RCRA and Clean Water Act regulations. DOE ordered to comply, but argues that interpretation of Atomic Energy Act gives it sole regulatory authority. DOE agrees to "voluntarily" comply with court ruling and does not appeal.
Abbott v. NLO (1984)	Widow of Fernald worker sues NLO over wrongful death. Case eventually settled out of court.
Crawford v. National Lead of Ohio (1985)	Class-action litigation over radioactive pollution at Fernald facility under the Refuse Act of 1899. (Case resolved in 1989 with cash settlement).

Defining the Problem and Fashioning the Causal Story

Although policy reform victories by opponents of nuclear weapons production policy were limited to a handful of court decisions and small-scale actions by federal and state governments, perhaps the most important product of opposition efforts was altering the formerly positive image associated with the policy. An important element of the increasingly negative image was the manner in which the problem was defined. Policy reformers argued that the accidents and problems were not simply the result of an aging nuclear weapons production infrastructure beset by unintentional errors by well-meaning organizations. Rather, the causal story was a mixture of related elements which including negligence, deception about risks, disregard for the law and inadequate administration of the policy process. The problem definition and the causal story were tailor-made for proponents of policy reform. As noted above, the accidents, mishaps and revelations associated with nuclear weapons production, placed the issue on government agendas and provided potent ammunition for policy reformers to present their case to various political venues. The fact that the AEC and DOE played an active role in attempting to conceal

the problems, all the while arguing that safety was assured, added a damaging element of purposeful action and misconduct, and contributed to an overwhelmingly negative causal story.

Whistleblowers

Although it was not necessarily a tactic utilized by policy reformers, the actions of “whistleblowers” proved to be an important component of the problem definition process. The veil of secrecy surrounding nuclear weapons production effectively concealed production-related activities for over three decades. Moreover, workers in the complex had to abide by strict security regulations that prevented them from openly discussing their occupational activities.

As the 1970s progressed, however, a small number of nuclear weapons complex workers went public with stories of operational mishaps and mismanagement. The information made available by these whistleblowers was essential for revealing the environmental and safety problems in the production complex, and in providing information that served as a key part of the emerging causal story. Whistleblowers revealed damaging information about radioactive waste leaks at the Hanford Reservation (Burnham 1980), mercury pollution at the Oak Ridge complex (Marshall 1983) and production reactor mishaps at the Savannah River facility (Lanouette 1990).

A damaging feature of the information revealed by whistleblowers was the fact that many of the operational practices occurring in the weapons production complex were strictly prohibited at commercial nuclear power facilities. Waste management practices, reactor operations and safety supervision regulations at weapons production facilities

were revealed as much less stringent than those in place at commercial power reactors. In addition, whistleblowers revealed an inadequate system of policy oversight where DOE officials were generally unaware of the details of day-to-day weapons complex operations. Such information also pointed out the problems in the communication structure of the organizational structure. Critics of nuclear weapons production policy had long argued that there was a need for independent oversight of the process, and the insider information from whistleblowers appeared to confirm those concerns.

Utilizing the Freedom of Information Act

Another key mechanism that contributed to the causal story was the Freedom of Information process. The Freedom of Information Act (FOIA) became law in 1966 as a means to place government action and information, in the form of documents, in the public realm. Amendments to the FOIA in 1974 reduced some of the barriers to national security information, and made available a surprisingly large amount of information about nuclear weapons production operations (Wald 1984, Wasserman and Soloman 1982). Rather than seeking data about the number of weapons or amount of materials produced, policy reform proponents instead sought documentation concerning the environmental and health aspects of production activities. This included routine environmental audits and reports, occupational exposure data, accident data and a variety of miscellaneous documentation generated by seemingly routine government and contractor activities and communications (Wasserman and Soloman 1982). As important as the FOIA process was in removing some of the secrecy surrounding weapons production operations, it proved to be particularly devastating for the policy image because much of the information was directly contradictory to AEC/DOE safety assurances. Although the

FOIA process had been critical in formulating the emerging causal story through 1985, it would have more potent effects starting in 1986. As we will see in the next chapter, the smoldering causal story turned into a conflagration as more negative information about nuclear weapons production policy made its way into the public realm, in part, because of the FOIA process.

The Evaporation of Public Trust in Government

Complicating the image problems of nuclear weapons production policy was the increasingly problematic issue of declining public trust of government more generally. The growth of negative images about nuclear weapons production policy at both national and local levels developed within a larger society-wide phenomenon where citizens were gradually losing trust in government. In 1965 and 1966, Yale political scientist Ralph Lane published two articles in which he examined public attitudes toward American social and political institutions from the 1930s through the early 1960s. Lane found that on a number of different indicators, Americans exhibited positive attitudes about the operation of society in general and of the American political system in particular. From a low-point during the Great Depression, Americans demonstrated an increasingly positive attitude toward political institutions believing the U.S. political system was honest, effective, and responsive (Lane 1965, 1966). According to data compiled by Lipset and Schneider (1987), nearly four out of five Americans polled in 1964 trusted government to do right most of the time. According to the Survey Research Center at the University of Michigan, this high level of trust in government had existed since the first widespread polling had been conducted in 1952 (Miller et al. 1980).

The mid-1960s was the high water mark of public trust in government. Lipset and Schneider (1987) analyzed the development of a “confidence gap” in American public attitudes where there was an unmistakable decline in public confidence in government over a twenty-year period. No single event fueled the confidence gap, according to Lipset and Schneider, but social and political controversy during the 1960s and early 1970s was central to the phenomenon. The significance of the confidence gap, according to the authors, was that increasingly larger portions of the American public were losing confidence in government institutions to be truthful and trustworthy about their policy activities. The specific result, according to the Survey Research Center at the University of Michigan, was a significant erosion of public trust in government from 1964 to 1980. According to the data, the proportion of respondents who felt that “you can trust the government in Washington to do what is right only some of the time” or “none of the time,” rather than “just about always” or “most of the time,” went up from 22 to 44 percent between 1966 and 1970. In 1974 the number was 62 percent. By 1980, the mistrust indicator had risen to 73 percent (Miller et al. 1980).

Although specific survey data for trust in the organizations responsible for nuclear weapons production policy was never gathered, it is reasonable to conclude, based on the available information, that a decline of trustworthiness in the AEC and DOE was a microcosm of decline of public trust in government. Since the Manhattan Project, the federal government had cultivated a positive image of responsible and safe operations involving nuclear weapons production. The AEC focused its public relations campaign on building a strong degree of public trust in its activities through communication that the work was being conducted by experts for national security and that safety was assured in

the conduct of production operations (DOE 1993, Dycus 1996, Wasserman and Soloman 1982).

As the series of accidents, mishaps and revelations at the weapons complex were reported, however, serious questions were raised about the image of safety. As the image of safety eroded so too did the trustworthiness of the government. According to interviews conducted for this study, the issue of trust became particularly troublesome for residents living in proximity to production facilities. These citizens found the assurances of the AEC and DOE less credible especially as information about problems became more readily available and as groups of opposition scientists produced their own studies of environmental, safety and health risks. A feature repeatedly found in interviews, media coverage and opposition literature was that the government could not be trusted when it came to statements about the nuclear weapons complex (Crawford, interview 1999, Rogers, interview 1999).

The environment of mistrust was increased by controversies surrounding atomic veterans, armed forces personnel who took part in testing activities during the 1940s and 1950s. In a celebrated case in Utah in 1982, a federal judge ruled that government scientists had deceived the court in a 1958 trial concerning the risks of radiation exposure from radioactive fallout. In addition, government credibility was increasingly in doubt particularly as the issue of nuclear waste came to a head during the early 1980s. The effort to choose a final burial site for nuclear waste was characterized by extensive political conflict between federal and state governments and between citizen organizations and the Department of Energy (Carter 1987).

Aside from the accidents and mishaps, the single overarching issue which, and had an impact on policy images from 1970 to 1985, it was the issue of radiation and human health. In terms of policy image and venue, radiation and human health was critical for policy change because it contributed to a growing negative image of nuclear weapons production, elevated the issue to national agenda status and probably negatively impacted the trustworthiness of the government.

Conclusion

By the end of 1985 change was well under way in nuclear weapons production policy. The once solid institutional structure had been altered with the demise of the Joint Committee and the AEC. Despite these changes, the structure of self-regulation had remained essentially unchanged. Nevertheless, opposition had emerged which focused on the problems inherent in self-regulation and the necessity of establishing some amount of independent oversight of weapons production, particularly its health-related aspects. Most importantly, the environmental, safety and health implications of nuclear weapons production policy had moved onto important political agendas at the national and state government levels. Congressional hearings focused on radiation and health issues starting in the late 1970s, and high profile controversies at Savannah River and Oak Ridge in 1983, and Fernald in 1985. Although Congress focused on nuclear weapons production policy in a handful of cases, no legislation was produced that altered the institutional structure or initiated significant policy changes. As we saw above, Congress debated shifting radiation-related health authority away from the DOE in 1979 and again in 1985, but produced no specific legislation. There was also House debate in 1985 over

whether to allow the EPA to set and enforce radiation protection standards at DOE facilities, but this proposal was not considered in the Senate.

If any institutional venue played a significant role in policy change from 1970 to 1985 it was the federal court system. After early reverses, opposition groups and state governments successfully utilized the court system as a venue for initiating weapons production policy change by arguing that the DOE should follow the guidelines established in NEPA and RCRA. The courts were in general agreement with this position and although the DOE was reluctant it nevertheless abided by court orders, thereby creating and solidifying an important precedent for successful resolution of policy conflict. At the state court level, litigants were successful in their efforts to establish some degree of contractor responsibility for occupational deaths. Although the government was not a party to the litigation, the overall implication for weapons policy was certainly negative.

Perhaps the most important changes occurred in the images associated with nuclear weapons production policy. As accidents and mishaps in the production complex mounted, as illustrated in Table 5.7, the visibility of nuclear weapons production policy was raised significantly through national and local media attention. The nature of accidents involving radioactive and hazardous materials simply could not be characterized as positive despite the government's assurances of safety. The emergence of health-related analysis cast further doubt on the safety of weapons production activities and also raised serious questions about government credibility. Although congressional attention to nuclear weapons production policy could be characterized only as sporadic, it was overwhelmingly negative in its tone.

The revelations of problems in the weapons complex also stimulated the formation of opposition groups at the national and grassroots levels. These organizations used a variety of tactics in their efforts to bring about change and met with varied success. Moreover, opposition groups were able to fashion a definition of the problem as one characterized by policy mismanagement, deception about health and safety risks, and disregard for the law. In addition, the accidents and mishaps in the weapons complex, coupled with the federal government's reluctance to address the emerging problems energized some state governments into activity. While state-level activity was limited, weapons production policy became a prominent feature of policy venues in Colorado, Idaho, Ohio and South Carolina.

In chapter 6 we will see the key image and venue dynamics expand considerably. What was emerging as slow change by the end of 1985 would develop into an accelerated phenomenon and bring about sweeping changes that would fundamentally transform nuclear weapons production policy by 1994.

Chapter VI: Policy Monopoly Disintegration and Transformation, 1986-1994

There was a military culture throughout the agency, a bunker mentality. People saw their role as meeting the requirements for defense. They saw completing the goals for materials production as their crucial mission. Every penny that went to safety programs was a penny taken from manufacturing nuclear warheads.

Former Reagan administration official quoted in the *New York Times* 1988 (Nov 7, 1988 p. 12)

This chapter examines the period from 1986 through 1994. This time period saw rapid change in nuclear weapons production policy. What began as an effort to focus more attention and effort on environmental, safety and health issues in 1986, had, by 1994 changed to a massive effort to rectify the pollution and contamination problems resulting from nuclear weapons production policy. This period of time also saw the full maturation of policy reform forces, manifest in new institutional forms and the participation of previously excluded political entities in completely new policy arenas. The chapter begins by examining key events that negatively affected the image of nuclear weapons production policy in 1986 and stimulated an extensive amount of high level attention.

Policy Images Take a Pounding: Hanford's Secret History

1986 started off badly for the image of nuclear weapons production policy and the Department of Energy. Already reeling from criticism about a string of accidents, mishaps and revelations of contamination across the production complex, the agency's bruised

image took a major blow in March when nearly twenty thousand pages of documents about the operational history of the Hanford Reservation were released to the public (Gerber 1992). The release, prompted in part by Freedom of Information Act requests, as well as congressional pressure on the DOE, was preceded by an announcement in December 1985 that the DOE would begin a health analysis of the population living near the Hanford Reservation. The environmental audits and reports released in March dated back to the beginning of nuclear weapons production operations in 1943, and told a story of intentional and accidental events that had exposed the entire region to high levels of radiation. For example, the documents indicated that between 1944 and 1956, over 500,000 curies of radiation were released into the local environment. By comparison, the release at Three Mile Island in 1979 was about 15 curies (Wald 1986). Perhaps the most disturbing revelation was that at no time did the Atomic Energy Commission or its successor agencies explicitly warn the local population or take any special safety precautions because they considered the releases well within established safety parameters. In fact, AEC and its Hanford contractors consistently reassured the public that the facility's operations were well controlled and harmless (Gerber 1992, Steel 1988).

The release of the Hanford documents was a public relations disaster for the image of Department of Energy and nuclear weapons production policy. Until the documents were made public, the accidents and mishaps at Hanford, indeed across the production complex, were generally seen as unintentional necessities born of a vital national security mission (Gerber 1992). Suddenly, however, the image of weapons production policy at Hanford mutated to one characterized by deliberate exposure to radiation for experimental purposes. Polls taken in the immediate aftermath of the information release indicated that

residents of the Pacific Northwest harbored a growing mistrust toward the Hanford operations (Steel 1988).

The immediate fallout from the document release took the institutional form of the Hanford Health Effects Review Panel, a 13- member body sponsored by Oregon, Washington and three Native American tribes in the area. Working in conjunction with the National Centers for Disease Control, the panel initiated its own health survey of the region and uncovered widespread health problems among the local population. Although the health problems of regional residents could not be definitively tied to specific incidences, the emerging image was that they were in fact the result of radiation exposure from operations at the Hanford Reservation (Gerber 1992, Wald 1986).

More Image Problems: Savannah River History

As if the revelations about Hanford's history, and questions about reactor safety, were not damaging enough for nuclear weapons production policy, a report issued by the Environmental Policy Institute (EPI) in July 1986 created additional controversy. The report, entitled "Deadly Crop in the Tank Farm," was the product of a five-year effort by the EPI. The Washington, D.C.-based organization used litigation, pressure from Congress, and the FOIA process to gain access to operational data compiled between 1953 and 1982 by du Pont, the prime contractor at the sprawling Savannah River site. The report was an indictment of operational administration and the data presented in the findings directly contradicted DOE and du Pont safety assurances. Among other matters, the EPI report found shoddy record keeping, incomplete worker exposure data, reports of waste leaks and routine hazardous material dumping, extensive ground water contamination across a 300-square mile area, and a series of practices which were banned in civilian power reactor

operations. More troublesome was the threat posed by various risk scenarios involving accidental releases of radioactive materials into the environment. The DOE and du Pont claimed the risks of catastrophic accident at Savannah River as extremely remote, while the EPI report contended that gaps in the official record made any such assurances meaningless (Marshall 1986a, Wald 1986a). Once again, the official statements appeared to be less than reassuring to an increasingly wary and attentive public.

In many respects, the EPI report was problematic for nuclear weapons production policy as any previously released study. Like other studies produced by reform-oriented environmental organizations, the EPI report shed additional light on the serious ES&H problems of nuclear weapons production policy, and revealed a long history of environmental abuse. In addition, the report created additional credibility problems by casting doubt on government assurances of safety. Moreover, the EPI report was widely circulated and many specialized journals reported its findings (Marshall 1986a). Unlike other reports, however, the timing of the EPI's report could not have come at a more difficult juncture for the image of nuclear weapons production policy. In the aftermath of the Hanford history revelations, the EPI report was released in the midst of growing controversy about military reactor operations, an issue made more problematic by events on the other side of the globe.

Chernobyl and its Political Fallout

On April 26, 1986, one of the four reactors at the Chernobyl nuclear complex in the Soviet Union experienced a series of events that led to a reactor core meltdown and produced a massive release of radioactivity. Perhaps more than any other incident, the Chernobyl disaster focused widespread, high-level attention on the nuclear weapons

complex. Prior to Chernobyl, the attention to the problems in the weapons complex had been sporadic and generally local in nature. As we will see in more detail below, the level and tone of national attention, as measured by national media sources and congressional activity, increased dramatically in the aftermath of the Chernobyl disaster. What had been an incremental approach to policy change during the early 1980s, increased to a ferocious pace after Chernobyl.

Just two days after the Chernobyl fire, a coalition of 18 national environmental and anti-nuclear organizations called for an immediate shutdown of all nuclear power facilities including military production reactors. The coalition focused its attention specifically on the “N” reactor, a plutonium production facility, at the DOE’s Hanford Reservation. The coalition argued that because of design similarities to the Chernobyl facility, combined with the fact that the military production reactor lacked a containment structure required by all commercial nuclear reactors, the N reactor presented the threat of a similar catastrophe in the U.S. (Molotsky 1986). Critics went on to point out that the DOE and its predecessor agencies had consistently chosen not to build containment structures at any of the military production reactors because it was never considered cost effective. Moreover, the opposition groups argued, no independent regulatory regime existed to require any such safety equipment or procedures at military production reactors (Diamond 1986).

The Department of Energy was quick to point out that while the N reactor shared some technical similarities with the Chernobyl reactor, the chances of a similar accident were extremely remote due to the “sophisticated [and] redundant” safety systems in the Hanford reactor (Boffey 1986). Moreover, the agency argued, national security concerns

precluded closure of the reactor. Seeking to allay concerns about the reactor, a technical safety appraisal released by the DOE in June 1986, found “no indications” that “employees or the public are being subjected to unacceptable risks” by the operation of the N reactor (Norman 1986, 1029). Despite DOE's apparent confidence, an ad hoc panel of six nuclear power experts was formed to provide a more objective analysis in the face of mounting public doubts. The findings were not encouraging for the image of the agency or nuclear weapons production policy.

The panel convened by the DOE was a group of six nuclear experts who were directed to specifically examine the technical and operational aspects of the N reactor. If the DOE was hoping for a positive image, echoing its own safety appraisal, it was severely disappointed when the panel issued its report in October 1986 (Albright 1986). The strongest remarks came from the nominal chairman of the committee, Lewis Roddis, who recommended that the reactor be shut down immediately unless the government could make a positive judgement "that the requirements for defense material warrant accepting public hazards exceeding those of commercial reactors." Roddis criticized the significant differences between the government's “lax approach to safety” at its military reactors and its tougher handling of civilian reactors commenting, "a commercial reactor faced with such a large number of recommendations [for safety improvements] would very likely be forced to close until all were completed." Roddis concluded with the simple suggestion that the N reactor be “put out of its misery” (Marshall 1987, 17).

Another member of the panel, Harold L. Lewis, criticized the "closed nature of the DOE community" and recommended a more open process of decision making and "serious efforts to improve [independent safety] oversight." Along with recommending that the N-

reactor be shutdown, Lewis saw wider problems with the DOE's "family style" management of the reactor and called for a permanent, independent safety oversight body to monitor all defense reactor operations. Finally, all six members of the Roddis Panel recommended that DOE create a permanent, independent oversight body for improving its military reactor safety programs (U.S. Congress 1987a, Marshall 1987, 17).

The DOE reacted to the Roddis report by reversing its earlier position and initiating a six month shutdown of the N reactor in December 1986 for a \$50 million modernization and safety improvement. The move was criticized by some members of the Congress, along with environmental protection organizations, who stated that because the reactor was scheduled to go off-line by 1995, any repairs would not only be financially wasteful, but would fall short of bringing the reactor up to the tougher safety standards of commercial plants (Wald 1986). Relying on a proven tactic, the Natural Resources Defense Council, joined by 12 members of Congress representing the Pacific Northwest, asked the DOE to delay all work on the N reactor until a full environmental impact statement could be prepared, or face a lawsuit (Wald 1986). Eventually the DOE decided not to restart the reactor, a move compelled by congressional unwillingness to fund the N reactor, choosing instead to lobby for a new production reactor (Marshall 1987).

More Chernobyl Fallout: The National Research Council Report

In the wake of the Chernobyl disaster the DOE contracted the National Research Council to conduct a more general analysis of the technical and managerial dimensions of the nuclear weapons production complex. The NRC report, focusing specifically on the production reactor operations at the Savannah River and Hanford sites, was released in October 1987. Much like the Roddis Panel findings of a year earlier, the NRC conclusions

represented a serious blow to the image of nuclear weapons production policy and opened the door for major institutional changes.

The NRC found that poor communications between DOE and its Savannah and Hanford contractors was an indication of wider management and oversight problems. For example, the failure to adequately report and analyze dozens of unusual reactor events was evidence of the DOE's "propensity to manage its own affairs" out of sight of an independent safety oversight body. The NRC study criticized DOE management as "confused...ingrown" and "largely outside the scrutiny of the public." The problems were a reflection of a government-contractor relationship that relied "too heavily on contractor good faith" and not enough on expert, independent technical analysis. The NRC committee recommended that the DOE create an internal independent panel to provide safety and operational oversight and to make the bulk of its work available to the public. The NRC also recommended that DOE articulate a plan to make its reactors as safe as commercial facilities. The conflicting requirements of safety and production had caused a long running lack of coherency in efforts to set and meet safety goals, according to the NRC report. Finally, the report recommended an increase in safety audits at all DOE nuclear weapons production facilities, a practice that had languished during the 1980s (Marshall 1987d, 741, NRC 1987, 1988, U.S. Congress 1987b).

The most far-reaching effect of the NRC report was the criticism of the Energy Department's management of the weapons complex. The report made specific references to the difficulty of balancing weapons production goals with environmental, safety, and health goals. The investigations pointed to compelling evidence indicating weapons production was being emphasized at the expense of environmental, safety and health concerns. The

NRC report recommended that balancing DOE goals would require ending DOE's self-regulation by creating an independent oversight body to monitor ES&H activities at all nuclear weapons production sites (NRC 1987; U.S. Congress 1987a).

The findings and recommendations of the two expert panels were critical for laying a foundation for nuclear weapons production policy change. Unlike analyses and reports produced by policy reform-oriented organizations since 1970, the objectivity of the expert panels could not be criticized by supporters of nuclear weapons production policy. The individuals who made up the Roddis and NRC panels were not associated with any reform organizations, nor did they have an axe to grind regarding weapons production policy. In fact, many had been participants in nuclear technology policy and established impressive career credentials in advanced technology policy. Moreover, because both panels were able to access the generally hidden management and administration dimensions of nuclear weapons production policy, they were able to identify the essence of the ES&H problems plaguing the policy. Interestingly, the problems “uncovered” by the panels had been identified by policy reformers well before the Roddis and NRC reports were released. For example, the issues and problems associated with self-regulation of nuclear weapons production had been identified as early as 1970. The findings of the expert panels in 1986 and 1987 undoubtedly added some new information to the causal story, but their most important contribution, it seems, was to have added the prestige of a government appointed expertise to the ES&H issues. In short, key issues had finally gained the attention of experts whose advice was not easily ignored given the dimension of the problems. Finally, next to the specific findings of the Roddis and NRC reports, a key result was an increase in the interest of Congress.

Congress Awakens

Because of its ability to authorize legislation and appropriate funds, we would expect Congress to be a significant source of institutional change. As we saw in chapter 5, policy reform proponents had successfully placed important ideas on the congressional agenda. Several reform proposals that promised to alter nuclear weapons production policy in significant ways were introduced in 1985, but success was not forthcoming. Part of the reason for the lack of success was that the problems of nuclear weapons production policy had not generated enough attention and opposition across Congress that was strong enough to push policy change through the legislative branch. Prior to Chernobyl, a handful of local representatives had been critical of weapons production policy, but were essentially minority voices in Congress. Representatives such as David Skaggs (D-CO), Gus Luken (D-OH) and Ron Wyden (D-OR), along with Senators John Glenn (D-OH), Howard Metzenbaum (D-OH) and Tim Wirth (D-CO) were active in the effort to bring about policy change by introducing a variety of proposals which promised significant change for the facilities located in or near their states and districts. Other members of Congress, including Senators Mark Hatfield (R-OR) and Brock Adams (D-WA), along with representatives Norm Dicks (D-WA), and Les Aucoin (D-OR), did not necessarily lead the reform battle in Congress, but nevertheless emerged as vocal critics of nuclear weapons production policy.

While the members of Congress mentioned here were unable to build widespread support for policy reform prior to 1986, their legislative proposals would resurface on a regular basis thereafter and steadily gain more popularity. Moreover, the Chernobyl disaster, focusing attention as it did on the fundamental ES&H problems of nuclear weapons production policy, altered the nature of political conflict in Congress. The

generally quiet support the policy enjoyed seemed to quickly evaporate as more and more information about ES&H problems became officially known and as the national security justification became less salient. With the erosion of support in Congress, nuclear weapons production policy was ripe for change. Before examining specific policy outputs from Congress, the next section examines some of the attention and tone dimensions of Congress.

Figure 6.1 illustrates congressional attention to nuclear weapons production policy from 1986 through 1994 as reflected by the number of hearings per year. The figure clearly indicates a substantial increase in hearings through 1990 as numerous congressional committees reviewed ES&H issues in weapons production policy and debated a large number of legislative proposals. The annual number of hearings declines starting in 1991 possibly indicating a degree of stability returning to the policy process concerning nuclear weapons production after the upheaval from 1985-1990. The new policy was certainly not without controversy, but it was much less controversial, based on the annual number of hearings, than during the period when weapons production was the primary mission.

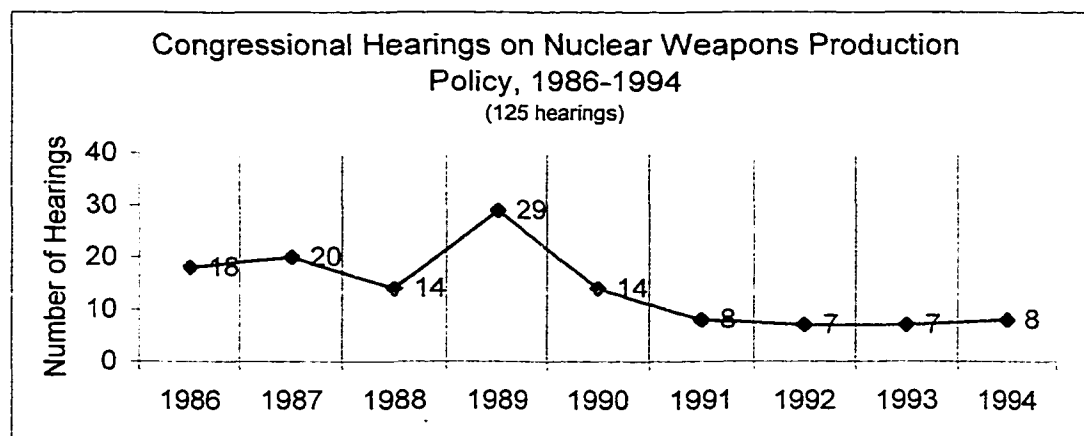


Figure 6.1: Congressional Hearings, 1986-1994

Questions might be raised about lower numbers of hearings in 1988 and 1990.

Three reasons might explain the dips. First, the number of hearings in 1989 is unusually large compared to any other year in the study period. Second, 1988 and 1990 were election years, which might have reduced time availability due to campaign requirements. Finally, the drop between 1989 and 1990 could have resulted from the Gulf War crisis of 1990-91 when attention in Washington was focused on the growing requirements of Desert Shield and Desert Storm operations.

Figure 6.2 illustrates the topics of congressional hearings. Each of the hearings were coded according to the same format as in chapter five: hearings that focused on routine matters such as budgetary, personnel and operational issues, and hearings which focused on environmental, safety and health matters. The figure below clearly illustrates that the majority of hearings between 1986 and 1994 focused on environmental, safety and health topics. In fact ES&H hearings were far more numerous on an annual basis than routine hearings.

Reviewing the topics of congressional hearings prompted adding an additional feature for display in Figure 6.2, noted as “Routine*.” Beginning in 1987, hearings which previously focused strictly on budgetary authorization and personnel matters, became a policy discussion forum for the budgetary and personnel implications of the ES&H issues of weapons production policy. In other words, because the ES&H problems had become such a prominent feature of the congressional agenda, the notion of what constituted a “routine hearing” was transformed. By 1989, House and Senate appropriations committees were suddenly grappling with decisions about funding environmental cleanup and compliance programs rather than merely appropriating funds for nuclear materials and weapons

production. Moreover, rather than merely rubber stamping personnel appointments, committees with energy and national security jurisdictions found themselves contending with serious opposition to and debate over individuals appointed to seemingly mundane assistant and deputy assistant secretary positions at the Department of Energy. By 1993, the notion of a routine hearing about nuclear weapons production policy had nearly disappeared altogether due to the expanding effort to implement environmental cleanup and compliance policies, as well as changes in nuclear weapons needs for national security purposes. These policy changes will be discussed in more detail below.

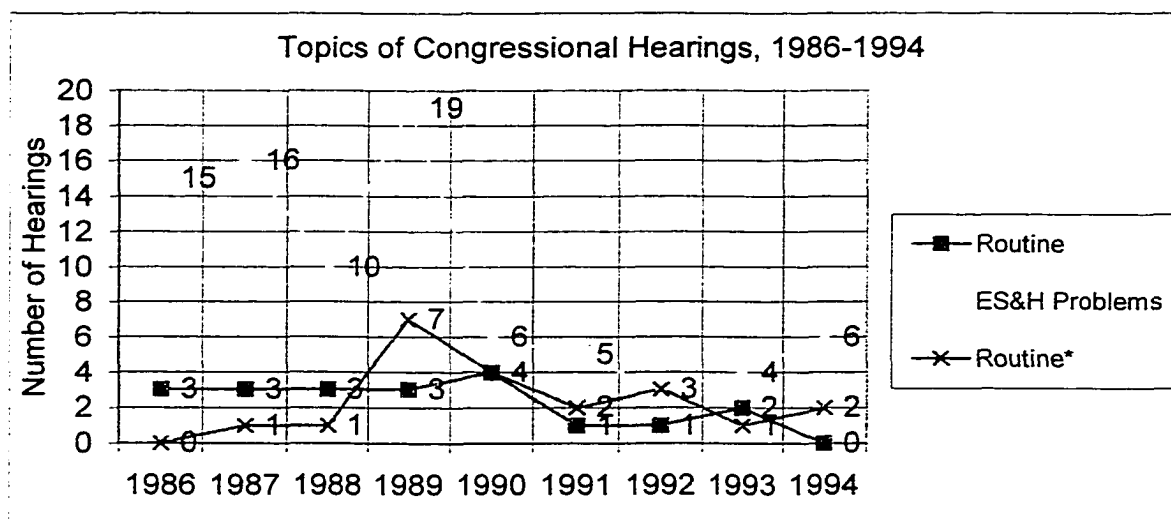


Figure 6.2: Topics of Congressional Hearings, 1986-1994

Figure 6.2 clearly illustrates that with the exception of 1992 environmental, safety and health problems were the majority topics during the nine years of congressional hearings coded for this chapter. In addition to the topic of hearings, it is important to also mention here the diffusion of attention to nuclear weapons production policy during 1986-1994 as illustrated by committees that held hearings. The punctuated equilibrium model predicts that as a public policy gains attention, and becomes more controversial,

jurisdictional boundaries begin to crumble. The political conflict attracts a greater amount of attention and members of Congress seek opportunities to involve themselves in the debate and gain opportunities or advantages. As more members become interested, more committees attempt to get involved in the policy conflict and make inroads on policy jurisdiction by holding hearings and debating various elements of the controversy (Baumgartner and Jones 1993). Table 6.1 illustrates the crumbling nature of jurisdictional boundaries in Congress and clearly illustrates the expansion of the conflict across the congressional body.

Table 6.1: Hearings by Congressional Committee, 1986-1994

House Committee	Hearings	Senate Committee	Hearings
Energy/Commerce	23	Government Affairs	16
Space/Science/Technology	14	Armed Services	10
Appropriations	13	Energy/Natural Resources	9
Armed Services	9	Environment/Public Works	7
Government Operations	7	Appropriations	5
Interior/Insular Affairs	5		
Natural Resources	2		
Merchant Marine/Fisheries	2		
Budget	2		
Education/Labor	1		

Table 6.1 reveals several notable features. First, is the diversity of committees holding hearings on nuclear weapons production policy, particularly in the House of Representatives. As the policy became increasingly controversial after Chernobyl and the investigations into reactor safety issues, a handful of committees with only tangential jurisdictional interests held hearings. One important reason was that members whose states or districts hosted nuclear weapons production facilities made an oftentimes vigorous effort

to involve their committees in the widening debate. For example, representatives from Washington, Colorado and Ohio were members of the House Energy and Commerce Committee during the height of the political conflict (CQ Annual Editions 1987-1994).

A second feature of the table is the fact that armed service and appropriations committees, which dominated the hearings during 1970-1985, were unable to maintain their hold on nuclear weapons production policy, particularly as ES&H problems dominated the policy debate. This was the case in both the House and Senate where committees with environmental, energy, and oversight responsibilities held more hearings than their armed service and appropriations counterparts during 1986-1994 by a ratio of roughly 2:1. Quite simply, the realities of ES&H problems in nuclear weapons production policy went far beyond simple matters of national security and budgetary appropriations and, as a consequence, gained the attention of committees with ES&H policy jurisdiction. As the number of policy reformers pressing their case before Congress increased, and as additional members of Congress became interested in policy entrepreneur possibilities, the ratio of hearings favoring environmental, energy and oversight committees indicates that nuclear weapons production policy had expanded far beyond purely national security and budgetary concerns. By way of comparison, the ratio of hearings between monopoly and non-monopoly committees held during 1986-1994 was a complete reversal of what it had been during 1970-1985 (see Table 5.4).

A more specific illustration of what crumbling jurisdictional boundaries looked like is presented in Table 6.2. As we will see below, the Federal Facilities Compliance Act of 1992 was one of the key pieces of policy change legislation to emerge from Congress. The legislative history of the FFCA illustrates that armed service committees were minor players

in the debate because other committees took a lead role in structuring the discussion over federal facility environmental compliance (CIS Annual 1992).

Table 6.2. Distribution of Hearings, Federal Facilities Compliance Act of 1992

Committee	Hearings
House Energy & Commerce	7
Senate Environment & Public Works	4
House Armed Services	4
Senate Government Affairs	2
House Government Operations	1
House Post Office & Civil Service	1

A final notable feature of Table 6.1 is the number of hearings held by the Senate Government Affairs Committee. While the committee boasts extensive oversight powers, the number of hearings may have had been stimulated more by committee personnel than any particular jurisdictional concern. John Glenn (D-OH) initially served as the ranking minority member on the committee from 1982-1986 and used his position to investigate problems at the Fernald, Ohio facility. After the Democratic Party regained the majority in the Senate in the 1986 elections, Glenn became committee chair and used his position to convene regular hearings on nuclear weapons production policy across the entire troubled complex. Reflecting the changing image of nuclear weapons production policy, Glenn remarked, "it will do us precious little good to protect ourselves from the Soviets or any other potential aggressor if in the process we poison or substantially irradiate our own people" (U.S. Congress 1988a).

As we might expect, based on the topics of congressional hearings from 1986-1994 and the increase in conflict over nuclear weapons production policy, the distribution of witnesses between members of the policy monopoly, proponents of policy reform and other

witnesses became more balanced. Figure 6.3 illustrates the distribution of witnesses at the 125 hearings coded during the period 1986-1994. In the same manner as Chapter 5, individual witnesses were coded according to their organizational affiliation and/or statements made during their testimony as reflected in the CIS database. Although some statements were more controversial than others, the coding process was based, as much as possible, on analyzing both affiliation and organization. The overall distribution of witnesses among the three coded categories during the period 1985-1994 was: Monopoly 42 percent, Reform 35 percent, and Other 23 percent.

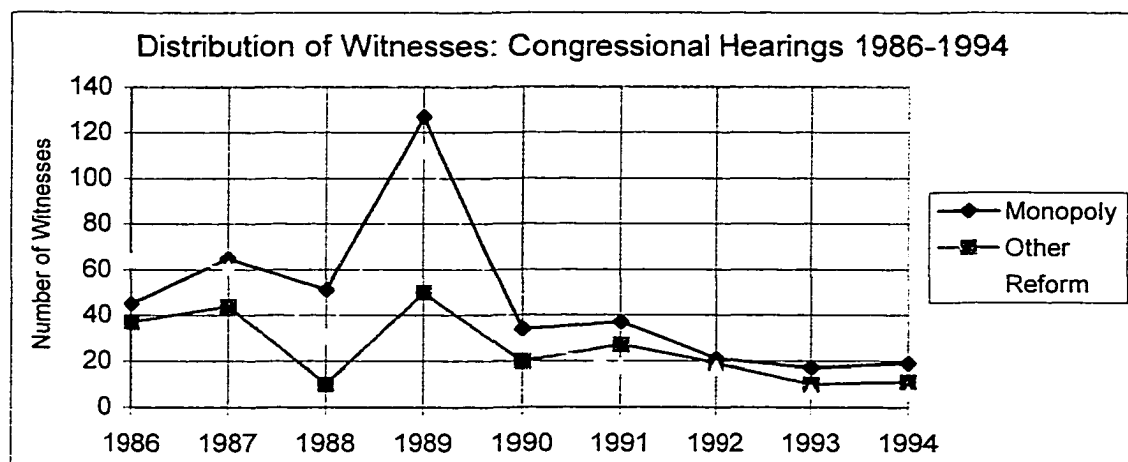


Figure 6.3: Distribution of Witnesses at Congressional Hearings, 1986-94

Comparing the distribution of witnesses between the two time periods covered by chapters 5 and 6 reveals an interesting feature as illustrated in Table 6.3. Quite simply, the percentage of witness coded as belonging to the nuclear weapons production policy monopoly declined between the two time periods, while the percentages of individuals coded as policy reformers and others increased. This comparison indicates that the dominance of the policy monopoly, as reflected by the percentage of witnesses testifying before Congress, was clearly less during 1986-1994. Meanwhile, policy reformers and

others were more frequent witnesses at hearings during 1986-1994. Although the overall percentage of policy monopoly witnesses was greater during both periods, the increase in the percentages of reformers and others offering testimony at congressional hearings is noteworthy. Changes in the figures indicate that policy reformers, as well as outside experts, were more successful at accessing Congress between 1986-1994 than the previous period of time. This is particularly important given the fact that representatives from key government agencies such as the EPA and the GAO, were regular participants in congressional hearings after the Chernobyl accident. While these outsiders could not be coded as reformers, their testimony about ES&H problems in nuclear weapons production policy tended to be of a negative tone because they discussed shortcomings in DOE ES&H programs.

Table 6.3. Comparing the Distribution of Witnesses Between Two Time Periods

Witness Category	1970-85	1986-94
Monopoly	61%	42%
Reform	24%	35%
Other	15%	23%

Does the information in Tables 6.2 and 6.3 indicate that the greater percentages of policy reformers and others testifying between 1986 and 1994 stimulated policy change? It is difficult to state that there is a clear causal link. However, policy monopolies thrive in an atmosphere of consensual decision making where real or potential policy reformers can be excluded from decisional processes (Baumgartner and Jones 1993). Yet by 1986, the consensus atmosphere was on the wane. The larger percentages of reformers testifying beginning in 1986 meant that the causal story of the ES&H problems in nuclear weapons production policy was presented more often in Congress and to an expanding group of

interested congressional panels. It is possible that because many of the policy reformers held impressive legal and scientific credentials in their particular fields of expertise a measure of credibility was added to the causal story and undercut efforts by the policy monopoly to deny the existence of ES&H problems. Moreover, some of the policy reformers were governors, state agency personnel, including attorneys general, and members of Indian Tribes, people who rarely, if ever testified prior to 1986, lending further credibility to the causal story and acting as a counterweight to the testimony of members of the policy monopoly. Finally, the expansion of activity by non-policy monopoly committees allowed greater numbers of policy reformers, along with unaligned policy experts, the opportunity to testify before Congress about the need for changes in nuclear weapons production policy.

One of the remarkable trends illustrated in Figures 6.1-3 is how the overall numbers of both hearings and witnesses declined significantly after 1990. Perhaps the most compelling explanation for this decline was that the controversy surrounding nuclear weapons production policy, which essentially began in 1983 and peaked in 1989, had abated. This is not to say that the policy conflict ended, but it received much less attention in Congress after 1989. An additional explanation of the decline of congressional attention was the emerging policy of environmental cleanup and compliance, while also controversial, was nevertheless a policy designed to address the ES&H problems. As the framework of the environmental cleanup and compliance policy emerged, it ushered in a period of reduced, or perhaps more focused, congressional attention.

Congressional Research Arm

It is also important to mention here the role played by two organizations of the congressional research arm. The General Accounting Office and the Congressional Office of Technology Assessment produce reports and policy analysis, and provide recommendations for specific congressional committees and Congress as a whole. This section does not attempt to make a determination concerning the influence of GAO or OTA analysis on congressional decision making about nuclear weapons production policy. In terms of focusing attention on nuclear weapons production policy, however, the GAO played an important role by reporting on ES&H issues, researching specific questions asked by Congress and providing policy recommendations to specific committees. In fact, in 1989 the GAO set up an office at DOE headquarters in order to facilitate its oversight and reporting process and often provided policy management recommendations directly to the Energy Secretary's office (GAO, 1991b). Figure 6.4 illustrates the GAO attention to ES&H issues of nuclear weapons production policy by the number of reports issued by year to congressional requesters. The reports issued by the GAO mirrors the rise and fall of congressional attention to nuclear weapons production policy.

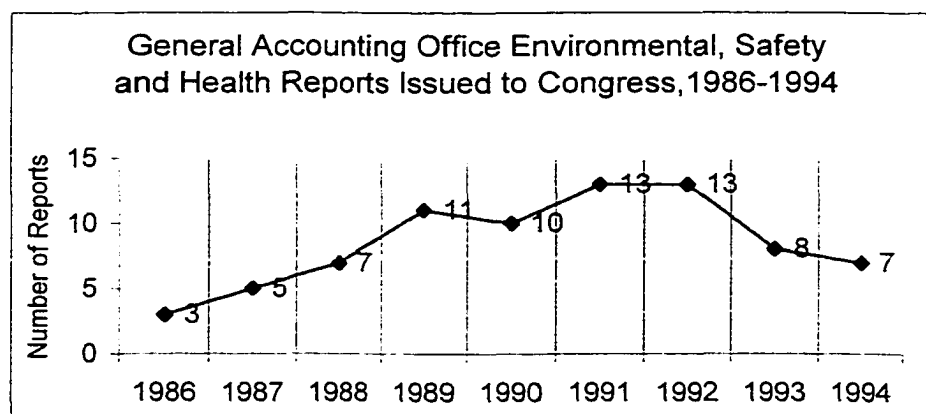


Figure 6.4: General Accounting Office Environmental, Safety and Health Reports, 1986-1994

The Office of Technology Assessment's analytical output was much less than the GAO's but no less important for illustrating the ES&H problems of nuclear weapons production, and for alerting the Congress and other interested readers of the dimensions of the emerging cleanup and compliance policy. The OTA released four comprehensive reports in the early 1990s: *Complex Cleanup: the Environmental Legacy of Nuclear Weapons Production* (1991), *Long Lived Legacy: Managing High-Level and Transuranic Waste at the Department of Energy's Nuclear Weapons Complex* (1991), *Hazards Ahead: Managing Cleanup Worker Health and Safety at the Nuclear Weapons Complex* (1993), and *Dismantling the Bomb and Managing the Nuclear Materials* (1993). Again, it is difficult to assess the impact of OTA reports on policy change. The reports, however, were systemic analyses, covering the entire spectrum of nuclear weapons production policy, and received widespread circulation on Capitol Hill, among national and grassroots groups, and in the national and local media.

New Institutional Structures

As new ideas come onto policy venues, the result is often the creation of new institutional structures or arrangements that reflect the ideas in concrete form (Baumgartner and Jones 1993). This section reviews the development of new institutional structures relating to nuclear weapons production policy. The general idea driving institutional developments was that federal facilities, particularly nuclear weapons production facilities, should abide by ES&H regulations. As we saw in chapter 5, this idea had come onto political agendas well before 1986, but had not matured into new institutional structures. Beginning in 1986, however, ideas about federal facilities and ES&H compliance quickly

spurred the development of institutional structures that would usher in an entirely new policy framework.

Reviewing the developments from 1986-1994, important new institutional structures emerged from several locations. Taken together the new structures altered institutional arrangements that had served as pillars of the weapons production policy monopoly for decades. Moreover, the emerging structures essentially created an entirely new policy framework, environmental cleanup and regulatory compliance, which was superimposed upon weapons production policy. The following sections examine the most important institutional structures that emerged from Congress from 1986 through 1994, as well as examining institutional changes that occurred at the Department of Energy.

New Institutional Structures Emerging from Congress

Because of its legislative powers, coupled with its control over appropriation and authorization matters, Congress is a key location for the development of policies containing new institutional structures. As we saw above in Figure 6.1, Congressional attention to nuclear weapons production expanded dramatically after Chernobyl. Many proposals were offered during the growing debate over nuclear weapons production policy, but only a handful actually passed into law. Nevertheless, new legislation produced new institutional structures that created opportunities for policy change in important areas.

The key institutional structures mentioned here are those that emerged from the legislative process. Many proposals dealing with nuclear weapons production policy were offered, but died somewhere in the process. For example, proposals were offered which would have stripped weapons production contractor immunity from lawsuits, blocked the conversion of civilian power reactors to military purposes, restructured radiation research

authority, and created an entirely new federal-level commission to oversee environmental, safety and health matters at both military and civilian nuclear reactors. These proposals were either incorporated into the legislation described below, or were eclipsed by rapidly changing events.

Superfund Amendment and Reauthorization Act: Pushing Federal Facilities Toward Compliance

One of the most important new structural arrangements to emerge from Congress from 1986-1994 was the Superfund Amendments and Reauthorization Act (SARA) of 1986 (P.L. 99-499). The original Superfund legislation, passed in 1980, had not included provisions about hazardous waste cleanup and environmental compliance matters at federal facilities. Indeed, reviewing the legislative history of SARA reveals nothing specific about nuclear weapons production sites. Section 120 of SARA, however, brought about significant changes regarding federal facilities by stating that that federal departments and agencies are subject to Superfund guidelines just like non-government entities.

Recognizing the growing controversies and problems associated with hazardous waste at federal facilities, Section 120 of SARA established a special set of requirements and timetables regarding cleanup at federal facilities. The requirements included assessments, site inspections, and inclusion on Superfund's National Priorities List (NPL). Seeking to establish an institutional framework for federal facility hazardous waste clean up issues, SARA also mandated interagency agreements between the EPA, the particular federal agency whose site would be included on the NPL, and the facility host state government. EPA and DOE concluded IAG model language in May 1988 that served as a boilerplate framework for the cleanup process. The model language focused on such key political

issues as policy jurisdiction among the IAG signatories, compliance with environmental regulations, dispute resolution and enforceability of the agreement (Davidson and Grundler 1990, Dycus 1996).

While SARA's section 120 did not prove to be a speedy or dispute-free method of dealing with hazardous waste problems at federal facilities, including nuclear weapons production sites, it nevertheless established a completely new policy framework which was superimposed upon nuclear weapons production policy. Nuclear weapons production facilities would henceforth be involved in a political process where they would be subjected to new sets of environmental regulations regarding hazardous waste management. Weapons production policy authority itself was never shifted away from the DOE under SARA. However, SARA allowed the EPA and host state governments to be more equal parties to an expanding component of weapons production policy: negotiating and overseeing environmental cleanup and hazardous waste management plans at weapons sites as specified in interagency agreements (OTA 1991, Seymour 1991). Table 6.3 illustrates when the major nuclear weapons production sites were added to the Superfund National Priorities List and slated for hazardous waste cleanup and compliance under SARA. The table also indicates the date of initial interagency agreement conclusion and the state agency party to the agreement. It is important to note also that most of the original IAGs were renegotiated as both the technical and political complexity of the site cleanup tasks became more apparent. Renegotiation processes were often characterized by conflict, but were successful in producing new agreements. The renegotiation dates were not included in Table 6.4.

Table 6.4: Nuclear Weapons Production Sites, National Priority Listing and Interagency Agreements

Weapons Production Site	National Priority Listing	Interagency Agreement Signed	State Party to the Interagency Agreement
Fernald, Ohio	Nov-89	Sep-91	Ohio EPA
Hanford Reservation, WA	Oct-89	May-89	WA Dept. of Ecology
Idaho Natl Engineering Lab, ID	Nov-89	Dec-91	ID Dept. of Health & Welfare
Mound, OH	Nov-89	Jun-90	Ohio EPA
Oak Ridge, TN	Nov-89	Nov-91	TN Dept. of Health & Env.
Paducah, KY	May-94	Apr-95	KY Dept. of Health & Env.
Pantex, TX	May-94	Apr-95	TX Dept. of Health
Rocky Flats, CO	Oct-89	Jan-91	CO Dept. of Health
Savannah River, SC	Nov-89	Aug-91	SC Dept. of Health & Env.

Source: OTA 1991, DOE

Institutional Spinoffs from SARA

Because of SARA's focus on federal facilities, additional institutional structures were created as a result of the Act. At the Environmental Protection Agency, for example, the Office of Waste Programs Enforcement (OWPE) established a Federal Facilities Task Force in early 1987 to focus resources on enforcing RCRA and Superfund requirements at federal facilities. By 1990 the Task Force had a permanent role within EPA's OWPE as the Federal Facilities Hazardous Waste Compliance Office. The goals of the FFHWCO are to assist the EPA in implementing Superfund cleanup agreements at federal sites on the National Priority List and to ensure compliance with the Resource Conservation and Recovery Act. Given the burgeoning number of federal facilities listed under Superfund starting in 1986, including weapons production sites, the FFHWCO quickly assumed an important oversight and enforcement role and represented the EPA's presence in the evolving policy of cleaning up the environmental legacy of nuclear weapons production (Davidson and Grundler 1990). By 1994, the department had evolved further to the Federal

Facility Enforcement Office within the EPA's Office of Enforcement and Compliance Assurance.

SARA also stimulated institutional dynamics at the state government level. By virtue of state government participation in interagency agreements, specific state agencies became permanent participants in the policy process. Although no new state agencies were created as a result of the IAG process, existing state ES&H agencies which were parties to the agreements expanded their own administrative capacity by creating programs and offices specifically dedicated to ES&H compliance at DOE weapons sites. Visiting the websites of the Washington Department of Ecology, the Colorado Department of Health and the Ohio Environmental Protection Agency, for example, illustrates that each of these organizations maintains an on going presence in the areas of environmental cleanup and ES&H compliance at nuclear weapons production sites. It is important to add that these same state-level agencies are involved not only with cleanup and compliance policies at nuclear weapons production sites, but at all federal facilities in their respective states

Independent Oversight: The Defense Nuclear Facilities Safety Board

Based in part on the recommendations of the Roddis and NRC reports, Congress created the Defense Nuclear Facilities Safety Board (DNFSB) as part of the National Defense Authorization Act of 1989 (P.L. 100-456). The enabling legislation gave the DNFSB extensive oversight powers independent of DOE. The DNFSB responsibilities included the ability to report directly to the President or the Secretaries of Energy and Defense, hold public hearings, provide recommendations to DOE, and provide yearly reports on ES&H issues to the Congress (U.S. GAO 1991b). While there was valid criticism that the DNFSB would not have effective enforcement authority over ES&H

matters, the Board was the first body independent of the institutional structure that made up the weapons production policy monopoly to have such responsibilities and authority. Although it is difficult to assess the actual influence of the DNFSB on nuclear weapons production policy, examining the Board's annual reports to Congress indicates an impressive expanse of ES&H oversight activity at all major weapons production facilities. Moreover, through its reporting to key officials, including members of Congress, the DNFSB was able to provide an official venue for weapons production policy oversight, including independent analysis, where none had previously existed (DNFSB Annual Reports to Congress 1990-1994). Finally, members of the DNFSB were witnesses at 15 of 30 congressional hearings from 1991-1994 indicating that at the very least Congress was receiving independent oversight information about nuclear weapons production policy.

Protecting Whistleblowers

Another structural feature emerging from Congress was the Whistleblower Protection Act of 1989 (P.L. 101-12). As we saw in chapter 5, whistleblowers had played a major role in uncovering the ES&H problems in the weapons production complex. Weapons production complex insiders went public with the stories of contamination and questionable operational practices at Savannah River, Oak Ridge, Hanford and Fernald (Burnham 1980, Lanouette 1990, Marshall 1983). In each of these cases, the site's prime contractor and the DOE had retaliated against the whistleblowers in an effort to silence them and squelch their negative stories, and prevent others from coming forward. The WPA deterred retaliation against whistleblowers and in fact encouraged more whistleblowing activities in the weapons complex by providing legal protection for such activities (CQ Annual 1989). Given the fact that the DOE was usually reluctant to release

any information about problems in the weapons production complex, the WPA served as an important mechanism for the continuing discovery of ES&H problems and attempts aimed at concealing them. In short, the Whistleblower Protection Act was a mechanism designed to lift that part of the veil of secrecy that had been used to hide the ES&H problems of nuclear weapons production.

Compelling New Perspectives : Modernizing and Restructuring the Weapons Production Complex

To the extent that policy planning processes can be considered an institutional structure, the National Defense Authorization Act for FY 1988/1989 (NDAA) mandated the DOE to produce a comprehensive modernization plan for the nuclear weapons production complex. The NDAA hearings indicated a strong desire by key congressional committees, particularly Armed Service committees, for the DOE to quickly develop an action plan for restructuring and modernizing the aging production complex (CQ Annual 1989). The impetus for the modernization plan mandate was the stark fact that much of the complex was obsolete and contributing to the serious ES&H problems. Moreover, projected changes in nuclear weapons needs created a situation where the far-flung production operations could be both minimized and centralized (DOE 1991). Most importantly, the modernization plan mandated by the NDAA initiated a process wherein the DOE would develop an action plan for environmental restoration and waste management across the entire weapons production complex. Prior to the NDAA, the DOE was reluctant to develop a modernization plan despite acknowledging the need for such action. Part of the difficulty was a lack of initiative by the Reagan administration to devote resources away from weapons production to modernization (CQ Annual 1989).

A censored version of the modernization plan was eventually delivered to Congress in January 1989. Known as the 2010 Report, the study predicted important changes in nuclear weapons production policy. For example, the report recommended shutting down materials production operations at the Hanford Reservation and the plutonium operations at Rocky Flats, and transferring those activities to other sites. In order to fulfill weapons materials needs two new production reactors would be built at Savannah River and the Idaho National Engineering Laboratory (INEL). The agency also intended to complete the construction of a Special Isotope Separation plant at INEL to convert DOE-owned fuel grade plutonium to weapons grade plutonium. Most importantly for this study, DOE projected that the ES&H compliance and waste management budget components would increase significantly between 1990 and 2010 (Marshall 1989). Figure 6.5 illustrates the projected growth of DOE budgets by function through FY 2010 according to the report.

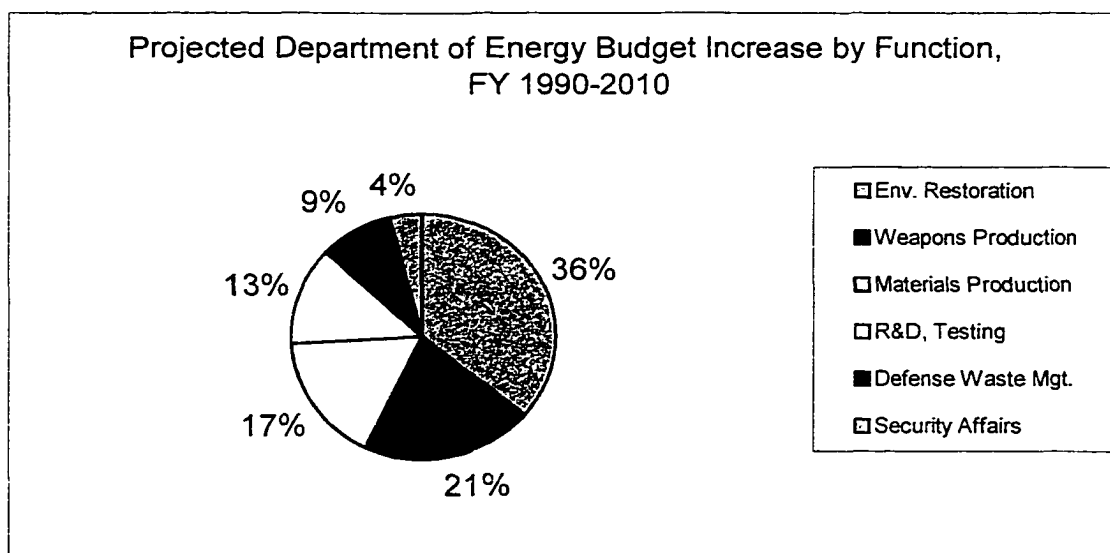


Figure 6.5: Department of Energy 2010 Report Budget Projections, FY 1990-2010 (Marshall 1989)

While the 2010 report was ambitious from several perspectives, particularly its emphasis on environmental restoration, the modernization plans were quickly outpaced by domestic and international developments which played a key role in reshaping not only the physical features of the weapons complex, but its very mission. These developments will be examined in greater detail below. Nevertheless, the 2010 Report represented a frank assessment of the future of nuclear weapons production policy and hinted at impending policy change (Marshall 1989).

The Federal Facilities Compliance Act: Closing the Circle

Another important legislative outcome was the 1992 Federal Facilities Compliance Act (FFCA). First introduced in Congress in 1988, the FFCA altered institutional structures in two important ways. First, the Act waived sovereign immunity against state imposed civil and administrative fines resulting from violations of the Resource Conservation and Recovery Act. Although SARA had given states an important seat at the environmental cleanup and compliance policy table, host states (and the EPA) were limited in their ability to enforce interagency agreements, or effectively deal with intransigence on the part of the DOE, because of the sovereign immunity doctrine. The controversy over state imposed fines was the subject of long and bitter court battles which resulted in the maintenance of sovereign immunity as long as a specific waiver of immunity was not established by Congress. With sovereign immunity waived in cases involving hazardous waste violations at weapons production sites, states were suddenly given a more potent enforcement tool in their efforts to compel ES&H compliance. Under the FFCA, DOE was granted an exemption from the sovereign immunity waiver for mixed waste containing both hazardous and nuclear material

pending development of treatment capacities and technologies. In addition, federal employees were granted immunity from civil liability authorized by the FFCA (Hourcle and McGowan 1993).

Second, the FFCA required annual EPA and or state inspections of all federal facilities to ensure compliance with applicable environmental laws. EPA and state inspectors were not given access to production secrets, but the inspection mandate played a significant role in lifting the veil of secrecy surrounding production operations, particularly those activities relating to environment, safety and health protection. In short, the interagency agreements gave host states the ability not simply the ability to monitor environmental cleanup actions, but a tool to actually measure cleanup and compliance performance by federal agencies.

After twenty years of at times intense political conflict, state governments, which had long been excluded from important dimensions of nuclear weapons production policy were now able to wield new powers to regulate the pollution and contamination at weapons facilities. More generally, the FFCA ushered in a new era of federal-state relations over the general question of authority concerning federal facility environmental compliance. The FFCA represented the maturation of the idea that federal agencies would be required to abide by federal, state and local hazardous waste regulations just like any other entity. Although the nuclear weapons production complex was the specific focus of the FFCA the Act essentially placed a regulatory framework around all federal agencies and promised to initiate a new era of environmental compliance (CIS Index 1993, Dycus 1992, Hourcle and McGowan 1993). The Federal Facilities Compliance Act proved to be no panacea to the ES&H problems in the nuclear weapons production complex. According to the General

Accounting Office, the enormity of the cleanup and compliance task created formidable administrative and organizational challenges to the capacity of the DOE (GAO 1994).

Policy Changes at the Department of Energy

Another important location of institutional dynamics was the Department of Energy. This section examines DOE institutional development in greater detail. Institutional changes at the DOE were less publicized, but no less important than those established by Congress. As we saw in chapter 5, the DOE had been under fire for several years before Chernobyl, but had done little to initiate significant structural changes. Some effort had been made in the direction of volunteering to comply with some hazardous waste regulations, but in general, the DOE effort was not manifest in any significant organizational and institutional changes. As we saw in Chapter 5, the most vigorous effort undertaken prior to 1986 was to begin the process of cleaning up defense wastes and relocating the materials to an underground facility in New Mexico. The slow approach to policy change was abetted in part by Congress, which did not produce any significant legislation to move the agency in the direction of change.

In the immediate aftermath of Chernobyl DOE leadership, moved in part by congressional prodding, became more energized. In June 1987, DOE Under Secretary Joseph Salgado informed the Senate Governmental Affairs Committee that the agency would conduct a year-long study of ES&H conditions throughout the weapons production complex. The study, released in July 1988, was the first comprehensive analysis of ES&H issues in the complex and appeared to signal the agency's emerging attention to ES&H issues in nuclear weapons production policy (Fehner and Holl 1995).

Minor institutional changes at the DOE were also underway. In the aftermath of Chernobyl, the DOE created its own Advisory Committee on Nuclear Facility Safety (ACNFS). The committee was designed to function as an independent, in-house review and advisory body reporting directly to the Energy Secretary about ES&H issues in the weapons complex. Specifically, the ACNFS had the responsibility to focus on issues where the proper balance between weapons production and safety was considered questionable (U.S. GAO 1990). Although some members of Congress applauded the move, others questioned whether an in-house advisory body could truly be independent and whether it would have any real authority over ES&H issues. Despite the DOE move, calls for an oversight body completely independent of DOE continued to mount (Fehner and Holl 1995, Marshall 1987d).

In December 1988, the DOE produced its “Preliminary Environmental Survey of Defense Production Facilities. The report was a preliminary analysis of 160 hazardous waste sites at the nuclear weapons production complex, ranking them according to their potential threat to public health and the environment. The analysis, initiated in 1986 was designed to assist the DOE in developing a more detailed long-range cleanup and compliance program (Marshall 1988).

Secretary James Watkins Initiates Policy Change

Significant institutional change originating from within the DOE did not fully emerge until new leadership took over the agency during the Bush administration under Energy Secretary James Watkins. After a long and distinguished career in the nuclear Navy, including working under Admiral Hyman Rickover, and serving as Chief of Naval

Operations from 1982-1986, Watkins was appointed to the Energy post by President Bush in January 1989 (Holt 1994, Dycus 1996, Fehner and Holl 1995).

After years of DOE passivity dealing with ES&H issues, Watkins brought an unmistakable “can-do” attitude to the job of Energy Secretary. In the wake of the policy conflict following Chernobyl, and the low-key approach to policy activity under the Reagan administration, Watkins presented a fresh and vigorous approach to the ES&H problems (Hubbard interview 2000). During his appointment hearings in early 1989, for example, Watkins articulated a clear understanding of the nature of the problems, sympathized with policy reformers by echoing their criticism of the agency, and promised quick and effective action. According to Watkins, “the [ES&H] problems have resulted from a 40-year culture cloaked in secrecy and imbued with a dedication to the production of nuclear weapons without a real sensitivity for protecting the environment.” Calling the DOE’s management system “antiquated,” Watkins acknowledged that one of his biggest organizational challenges was developing clear lines of authority in an institutional system where top level management and field offices rarely knew anything about day-to-day operations at the weapons production complex. Watkins also discussed the need to instill a new culture in weapons production policy, one which would de-emphasize the “trust me” attitude of the institutional structure, and elevate ES&H concerns to a status rivaling the weapons production mission (U.S. Congress 1989a).

Watkins wasted little time in initiating institutional changes at the DOE. Barely two weeks after his confirmation, Watkins appointed a special assistant for coordinating DOE defense waste management policy. He also ordered the preparation of a comprehensive environmental cleanup plan and initiated a reorganization within the agency aimed at

emphasizing ES&H compliance across the weapons production complex and improving the line management within the DOE's organizational structure.

In June 1989, the DOE released a report entitled "Environmental Restoration and Waste Management Five-Year Plan for FY 1991-1995," the first comprehensive strategy designed to address the ES&H problems in the weapons production complex (DOE 1989). The plan identified the key problems besetting nuclear weapons production policy, their causes and consequences, and spelled out the means by which the Department would resolve the ES&H problems. The drafting of the plan was itself a remarkable event given the amount of public review that went into the process. Unlike many of its previous analyses and reports, the DOE solicited participation through independent review from State governments, Native American tribes, environmental and other public interest organizations, and other Federal agencies (U.S. DOE 1989).

The release of the Five-Year plan was accompanied by the creation of the new Office of Environmental Management (OEM) at DOE, and the appointment of an Assistant Secretary for Environmental Safety and Health. The OEM was given the responsibility of overseeing the development and implementation of ES&H programs and the cleanup and compliance requirements of the agency (Fehner and Holl 1995). As illustrated by DOE budgetary information in Figure 6.4, below, The Office of Environmental Management quickly grew into a sizeable component of the agency.

With the establishment of the OEM, ES&H issues of nuclear weapons production policy were centralized at the DOE's headquarters rather than being scattered across numerous field offices with no coordination. Moreover, the OEM's reach into the field offices allowed it to establish a regular communications link thereby instituting a hands-on

approach to ES&H compliance across the entire weapons production complex (Hubbard interview, 2000). In short, the OEM was the central component of Watkins' effort to establish more effective line management at the DOE.

The Five-Year Plan essentially set nuclear weapons production policy on a different course. While the DOE had undertaken limited measures to address the ES&H problems in the production complex during the 1980s, the primary mission of the agency remained nuclear weapons production. The Five-Year Plan was more than merely an agency document describing a new program. The plan marked an important policy departure because it was the articulation of a new policy framework that officially committed the DOE to integrate environmental cleanup and ES&H compliance into its defense and national security related mission. While the Five-Year Plan was criticized, and eventually revised within a year, it nevertheless was the first design crafted by the federal government to deal with the ES&H legacy of nuclear weapons production. The plan was ambitious and expensive, estimated at costing between \$71 and \$110 billion over 20 years by the Congressional Budget Office (CBO 1990) and as high as \$150 billion over 30 years by the General Accounting Office (GAO 1989).

Finally, the crafting of the Five-Year Plan appeared to be evidence of an opportunistic organization (and agency chief) that faced an existential problem, particularly as its mission was increasingly in doubt. Since its creation in 1977, the primary mission of the DOE had been the production of nuclear materials and weapons. While the agency was involved in other aspects of energy and high technology policy, these were comparatively small components of the DOE budget. As the need for nuclear weapons began to decline, and as future defense projections foresaw a reduced reliance on nuclear striking power,

some prominent voices questioned whether the time had come to finally eliminate the agency altogether. Moreover, given the agency's history, some argued that the environmental cleanup and compliance mission would be better implemented by a different federal agency, one which had a better track record of environmental stewardship and relations with the public (DOE 1991, GAO 1991b, U.S. Congress 1989d).

The Five-Year Plan of 1989, and its subsequent revision in 1990 could be interpreted as a response to the agency's doubters. What better way to answer the critics than to embrace an entirely new agency mission while crafting a comprehensive, long-term and vigorous plan for its implementation? Watkins, and his administrative team at DOE, quickly became adept at articulating the idea that the DOE was the best choice for the cleanup and compliance mission. After all, Watkins argued, the agency possessed the institutional history for developing an adequate cleanup plan and already had agency personnel and resources moving in that direction. It proved to be a persuasive argument because there were no serious efforts by Congress to transfer the cleanup task to another federal agency.

Fostering a New Agency Culture

At the time of the release of DOE's Five-Year Plan, Secretary Watkins also announced his intention to instill a new culture at the DOE. Although organizational culture can be a rather nebulous term, it essentially describes the various operational aspects of organizational behavior and has been generally be termed as "the way things get done" in an organization (Schein 1989). The vision of the new DOE culture was described by Watkins in a June 1989, 10 Point Plan. The 10-Point Plan was described by Watkins as designed to, "effect a significant change in [DOE's] deeply embedded 35-year culture," and

correct what he called the "cultural misdirection" that had led to the ES&H problems (DOE 1989, 2-3). For the DOE, and its predecessor agencies, organizational culture was rooted in a commitment to the weapons production mission, a self-regulatory approach to the process, and an operational attitude that not only hid the process from outside scrutiny, but assumed that outside parties were unable to make useful or responsible input to the process (DOE 1989, Fehner and Holl 1995). Watkins' announcement represented an effort to embark on a rather remarkable task.

The emphasis on developing a new agency culture was clearly designed to boot the sagging image of weapons production policy and the DOE. In announcing the 10-Point Plan Watkins emphasized the need for greater openness to the public coupled with environmental protection. Watkins also pledged that the DOE would allow States and other Federal agencies, most notably the EPA and the Occupational Safety and Health Administration, direct access to DOE facilities in order to enhance ES&H monitoring and compliance. The emphasis on openness was designed also to change DOE's closed organizational culture to one of clear, open communication with the public, and an effort to end the "trust me" attitude characteristic of DOE's public relations (U.S. DOE 1989). The need to rebuild public trust in the institutional structure was clearly spelled out in a 1993 report to the Energy Secretary entitled, *Earning Public Trust and Confidence*. Published as Watkins was leaving office, the report acknowledged the importance of public trust, reviewed the erosion of public trust in the DOE and made recommendations regarding the enormous challenge associated with rebuilding trust. According to the report, improving agency relations with key stakeholders (i.e., state and local governments, and citizens

groups) was identified as an essential component of the DOE's new emphasis on environmental cleanup and compliance, and central to the new agency culture (DOE 1993).

Watkins also pledged that trouble-plagued facilities such as Savannah River and Rocky Flats, shutdown during the summers of 1988 and 1989 respectively, would not reopen until a culture was established that made safety the coequal of production. While some critics charged that Watkins' safety pledge was empty rhetoric, the record indicates that the DOE Secretary maintained this commitment during the course of his tenure at the DOE (Fehner and Holl 1995).

The DOE went further in its effort to boost its sagging image focusing on even the seemingly obvious. Beginning in 1991, the DOE began to rename its weapons production sites to reflect the new agency cleanup and compliance mission. For example the Idaho National Engineering Laboratory was renamed to the Idaho National Engineering and Environmental Laboratory. The Rocky Flats site was renamed the Rocky Flats Environmental Technology Site. In the battle to control policy images, the DOE clearly understood the need to operate facilities that at least sounded environmentally friendly. The DOE even went so far as to create a new title for the contractors at the weapons production sites, and call attention to their new mission, labeling them Environmental Restoration and Management Contractors (DOE 1996). Some policy reform organizations criticized the renaming effort as essentially meaningless, but the DOE had clearly embarked on an effort to remake its public image.

Structural Changes in Agency Culture

In addition to statements designed to rebuild DOE's poor public image, Secretary Watkins also initiated several tangible manifestations of the new agency culture. One of the

important manifestations of the new management culture was a change in the structure of weapons production operations contracts. The new contract structures were primarily a byproduct of congressional hearings where DOE officials often admitted that they were unaware of operational aspects of nuclear weapons production policy. Furthermore, GAO investigations revealed that contractors were often rewarded with sizeable bonuses despite poor ES&H performances. The new contract structure initiated by Watkins required that at least 51% of award fees would be based on ES&H performance measures, thus reversing the incentive structure away from production. In short, performance awards were to be based on the new value of environmental protection rather than the old value of production. In a further effort to compel contractor adherence to environmental considerations, the DOE developed new contract language that promised to hold contractors liable for penalties incurred from environmental violations. Part of the DOE's motivation in restructuring contracts was prompted by congressional debate over whether to lift contractor immunity from litigation over pollution control and hazardous waste violations (Kettl 1993, U.S. DOE 1989).

A second tangible manifestation of the new agency culture was Watkins' formation of so-called "Tiger Teams," groups of technical and policy specialists formed to visit weapons production sites in an effort to correct ES&H problem areas. In terms of attempting to craft a more positive policy image the "Tiger Team" concept was a good representation of the emerging image of the DOE: tough, vigorous, ready to publicize wrongdoing and set things right. From an institutional perspective, the Tiger Team concept was an indication that the DOE was acting to address the problems in the weapons complex and utilizing a new internal oversight mechanism to establish a direct connection between

DOE headquarters and weapons production facilities. Indeed from June 1989 to December 1992, Tiger Teams conducted ES&H assessments at 35 DOE sites and often acted as shock troops, raising the ire of contractors and DOE personnel alike. While the actual impact of the Tiger Teams on policy change is debatable, they did represent a new and vigorous effort to compile and report ES&H problems. Perhaps most importantly for the emerging policy image, the Tiger Team concept demonstrated an emerging commitment to enforce the law (GAO 1993, Marshall 1991).

Another manifestation of the new agency culture at DOE was Watkins' effort to centralize, and make accessible to the public, data relating to human health and exposure to radiation. As we saw in the previous chapter, the DOE had been criticized during congressional hearings in the late 1970s about its conduct concerning health-related data. Calls were made, and legislation introduced, to end the agency's monopoly, but little was done to alter the institutional arrangement. In 1990 Watkins established the Comprehensive Epidemiologic Data Resource (CEDR), a database on worker health from over 100 DOE contractor facilities, workers at nuclear power facilities and shipyards, military personnel involved in weapons tests, and uranium miners. In addition, access to the CEDR was not under control of the DOE, but the National Academy of Sciences. The DOE also turned over management of its analytic epidemiology program to the Department of Health and Human Services (Marshall 1990, Olshansky and Williams 1990).

Change in the structural arrangements of radiation health policy was significant evidence of change. For over 25 years the credibility and objectivity of radiation health sciences had suffered because independent analysis was missing. With the creation of the CEDR, however, the radiation health institutional structure overarching nuclear weapons

production was significantly altered. Henceforth, outside researchers would be able to replicate DOE analyses, analyze data using different methodologies and variables, and study different subgroups other than those selected for study by the DOE. In short, the critique that the “fox shouldn’t be guarding the hen house,” symbolism that dated back to the radiation health controversy of the late 1960s, was finally put to rest.

Solidifying the Emerging ES&H Mission: The End of the Cold War

The DOE’s emerging commitment to address ES&H problems in nuclear weapons production policy signaled a new mission. The enormity of the problems, and the political crisis atmosphere that descended upon weapons production policy after Chernobyl, meant that environmental cleanup and compliance could no longer be excluded from weapons production policy. While it was assumed that nuclear weapons production would be a necessary policy into the foreseeable future, ES&H would be a component of the policy. Although addressing the enormous ES&H problems was clearly a stimulus for the emergence of a new mission, changes in the international situation not only accelerated the development of the new mission, but acted to completely transform it.

By the mid-1980s, the Cold War rivalry was on the wane. New leadership in the Soviet Union under Mikhail Gorbachev, had initiated political openness and restructuring campaigns designed primarily to revive the sagging Soviet economic system. Gorbachev also brought a new set of ideas to the Soviet military perspective, which focused on the notion of “sufficiency” in nuclear firepower. Sufficiency was a means by which the Soviet Union could reduce its own expensive and hazardous emphasis on nuclear weapons production and solidify a greater degree of security. The new situation ultimately led to the Intermediate Range Nuclear Forces Agreement in December 1987, reducing mid-range

nuclear arms in Europe, and the Strategic Arms Reduction Treaty (START II) in January 1993 which promised to reduce strategic nuclear stockpiles to 6,000 warheads.

Sandwiched between the arms reduction agreements of 1987 and 1993 were a dizzying series of developments that quickly brought about the end of the 40-year Cold War. Germany reunified in October 1989. The Warsaw Pact was disbanded and the communist regimes of Eastern Europe collapsed. Russia military units were withdrawn from Eastern Europe and Afghanistan. The Soviet Union itself dissolved in the fall of 1991. Taken together, these developments created a national security situation that reduced the need for a large nuclear weapons arsenal. Major strategic weapons systems slated for submarines and intercontinental ballistic missiles were cancelled because the rationale for their development and deployment disappeared with the end of the Cold War (Fehner and Holl 1995). According to the Natural Resources Defense Council's nuclear weapons database, the number of strategic nuclear warheads in the U.S. arsenal declined from 14,040 in 1985 to 9,240 by 1994. The decline of tactical warheads was even more pronounced, dropping from 8,901 in 1985 to 2,048 by 1994 (www.nrdc.org).

Not only did the Cold War come to an end, officially announced by President Bush in late 1990, but other national security issues supplanted the declining superpower rivalry. Concerns over the aggressive behavior of Iraq in 1990-91, and general anxiety over the proliferation of weapons of mass destruction in the developing world, began to change the U.S. national security calculus away from emphasizing intercontinental and theater nuclear striking power. The new world order, with its complex set of security challenges and threats, would require a national security structure characterized by the rapid deployment of conventional forces and the use of smart technology rather than

strategic and tactical nuclear power. Although nuclear weapons would remain components of the U.S. military force posture, their role and numbers would be greatly reduced by the end of the Cold War (Fehner and Holl 1995).

Evidence of Policy Change: Greater Funding for Environmental Management

The effect on nuclear weapons production policy from the above developments can be seen in the DOE's annual budgetary distributions over a period of years. Table 6.4 provides a brief overview of the growth of the environmental function within the DOE for fiscal years 1978 through 2000. As the table illustrates, it was not until FY 1990, with the creation of the Office of Environmental Management, that the DOE had a full-time organizational arm devoted to environmental protection and cleanup issues. Prior to 1990, ES&H programs were just a fraction of annual DOE budgets and scattered across a large number of programs and field offices with no effective coordination from the headquarters level (Hubbard, interview 2000). The rapid growth of the EM budget, from 14 percent in 1990 to 35 percent of the total DOE budget in 1994 indicates a substantial shift of resources into new policy programs. Clearly the Department of Energy was placing a much greater emphasis on the environmental component of nuclear weapons production policy. Moreover, Congress was assisting in the shifting of resources, and the emergence of the new policy mission, by appropriating the necessary funding for the DOE. Although this study ends in 1994, Table 6.5 includes Environmental Management budgets through FY 2000 in order to illustrate the institutionalization of the environmental function within the agency and the solidification of the new cleanup mission.

Table 6.5: Environmental Component of DOE Annual Budgets (in thousands of dollars)

	Office of Environmental Management	General Environmental, Safety and Health	Total, Annual Budget, Department of Energy
FY 1978		61	10,515
FY 1979		59	10,325
FY 1980		65	12,011
FY 1981		62	10,329
FY 1982		49	11,640
FY 1983		42	11,165
FY 1984		42	10,539
FY 1985		38	12,365
FY 1986		43	10,567
FY 1987		62	10,125
FY 1988		68	11,163
FY 1989		91	11,697
FY 1990	2,274	112	14,053
FY 1991	3,518	96	15,917
FY 1992	4,289	157	16,762
FY 1993	5,520	190	17,544
FY 1994	6,000	169	17,035
FY 1995	5,809	178	14,844
FY 1996	6,010	166	14,137
FY 1997	5,991	161	14,898
FY 1998	5,863	157	14,424
FY 1999	5,832	149	15,921
FY 2000	5,928	154	15,941

(DOE 2000)

Secretary O'Leary and the Openness Initiative

The policy changes at the DOE begun by Watkins were continued under Energy Secretary Hazel O'Leary, appointed by President Clinton in December 1992. From an institutional perspective, O'Leary's most important act was to launch the so-called "Openness Initiative" in December 1993. The Openness Initiative was an effort to release previously classified documents related to nuclear weapons production and testing policy. The goals of the program were to reduce the amount of classified materials dealing with ES&H issues, streamline the agency's declassification processes, and develop an interagency mechanism for expediting declassification and release of shared information

(Fehner and Holl 1995). The Openness Initiative served to alter one of the most important components of the nuclear weapons production policy monopoly: secrecy. O'Leary estimated that there were over 32 million pages of classified documents and that the Openness Initiative would release the vast majority into the public sphere.

Although the program initially released information about previously secret weapons tests, along with locations and quantities of weapons and nuclear materials, the Openness Initiative quickly focused on one of the darkest legacies of the Cold War: human radiation experimentation. Although some of the radiation experimentation data had been released years earlier, the Openness Initiative release prompted a great deal of media attention. Within weeks President Clinton formed the Advisory Committee on Human Radiation Experiments (ACHRE) to provide advice to the Human Radiation Interagency Working Group, a body which included representatives from Energy, Defense, Health and Human Services, and Veterans Affairs Departments.

The ACHRE issued its final report in October 1995. The report found that in conducting radiation experiments between 1944 and 1974 the government expended little effort to obtain consent from subjects, operated a weak system of protecting the rights and interests of subjects and, in the process, created a legacy of distrust between citizens and government. The final report also recommended that the government issue apologies and create compensation programs, as well as establishing new procedures and protections to avoid a repeat of one of the darkest legacies of the Cold War. The DOE created a website featuring the ACHRE at <http://tis.eh.doe.gov/ohre/>. The website allows access to the final report, oral histories, and documentation about radiation issues from 1944 through 1974.

The Openness Initiative was probably Secretary O’Leary’s most significant contribution to policy change because it essentially altered the secrecy component of the original weapons production policy monopoly (Fehner and Holl 1995). The classification/declassification process had been an effective mechanism for controlling weapons production policy information during the Cold War whether or not data was directly related to production information. The structure of secrecy had hidden the vast majority of nuclear weapons information from the public, including information that dealt with radiation experimentation and radiation health issues. On other fronts, O’Leary continued to implement changes in DOE-contractor relationships, whistleblower protections and the refinement of ES&H compliance efforts. While these efforts were important in their own right, the implementation of the Openness Initiative essentially served as the final major component in the policy change process that had begun several years earlier (Fehner and Holl 1995).

The Organized Opposition

For reform-oriented forces, the period 1986-1994 brought about additional success and new opportunities. The tactics employed by policy reformers did not necessarily change, although there was a marked decline in protests and demonstrations after 1989, they merely expanded in their frequency. The following sections examine some of the key developments that occurred.

Accessing the Congressional Venue

As illustrated in Figure 6.3, policy reformers became regular participants at congressional hearings during 1986-1994. Hearings were an opportunity for grassroots

groups to reinforce the causal story of a government agency operating without regard for the safety and well being of people living in proximity to weapons production sites. Grassroots organizations also raised questions about the DOE's trustworthiness given the institutional history of secrecy and sometimes deception (Crawford interview 1999).

For national reform-oriented groups, testifying at congressional hearings presented an opportunity not simply to criticize the DOE, but also to advance concrete proposals designed to rectify policy problems (Norris, e-mail 1998). Members of the Natural Resources Defense Council and the Environmental Policy Institute, for example, were particularly vocal in their calls for independent oversight of weapons production, changes in the contracting system, as well as the general need for DOE to abide by ES&H regulations. Other organizations such as the Oil, Chemical, and Atomic Workers Union utilized congressional hearings as an opportunity to lobby for structural changes in the health and safety policies at the nuclear weapons complex. National groups utilized the congressional venue to pressure DOE for policy change. In all these cases, the lobbying was consistently directed at shifting structures in ways that would open up the previously closed institutional apparatus surrounding nuclear weapons production policy. As we saw above in the section on structures produced by Congress, many of the reform concerns were translated into concrete outputs.

With the advent of the Watkins' tenure at DOE, both grassroots and national organizations were able to access the agency's environmental compliance and cleanup decision making processes. Much of the DOE's new openness toward organized interests was a product of both political pressure on the agency, particularly from key members of Congress, as well as a recognition by the agency that rebuilding public confidence would

require involving the interested public (DOE 1993, Hubbard interview 2000). Once the DOE opened its doors to public participation, an institutional structure was the direct result.

A Place at the Table: Citizens Advisory Boards

One of the components of the DOE's effort to change its organizational culture was to foster a better relationship with the public by opening up its decision making processes. Toward this end, an important manifestation of the new agency culture was the institutionalization of "stakeholder management" where public participation in environmental cleanup and compliance decisions would be encouraged. Particularly for grassroots organizations, stakeholder management was a concept where their activism was transformed into participation in the emerging policy framework. Beginning in 1993, local site-specific advisory boards, better known as Citizens Advisory Boards (CABs), were established at nuclear weapons production sites to ensure that the principles, priorities and values of local stakeholders would be included in environmental cleanup and compliance programs. Eventually, CABs were established at 12 DOE weapons production sites and dozens of other federal facility cleanup projects.

The CAB concept sprang in part from a 1991 recommendation by the Congressional Office of Technology Assessment. Arguing that ensuring public acceptance would be critical for successful environmental cleanup and compliance, the OTA recommended creating site-specific advisory boards composed of local stakeholders to aid in the policy planning process (OTA 1991). The CAB concept was also the product of the Federal Facilities Restoration Dialogue Committee (FFRDC) created by the Environmental Protection Agency in 1992. The FFRDC was composed of individuals from a cross-section of federal, state, local, tribal and unaffiliated organizations who were

brought together to establish cleanup guidance. Much like the OTA recommendation, the FFRDC argued that community involvement in the cleanup planning was vital for success (FFRDC 1996). Based on these recommendations, and seeking to rebuild public trust, the DOE initiated the CAB program in 1993.

The purpose of the CABs is to draw on the diversity of local community views to provide “independent, consensus advice and recommendations to DOE on issues of environmental remediation and waste management that have potential to affect the surrounding community” (Bradbury and Branch 1999, 1). The CABs have direct, regular contact with the EPA, the DOE’s Office of Environmental Management, and state government agencies involved in cleanup projects. In addition, signatories to interagency agreements serve as ex-officio members of CABs (Walpole interview, 2000). In short, CABs represent a mechanism whereby local stakeholders can influence the cleanup of weapons production sites. One of the remarkable features of the CAB concept is that the DOE provides annual funding for staff, operating expenses, research projects and outreach activities of the organizations. The success and influence of the CAB structure, measured by the integration of CAB recommendations into cleanup planning and decision making, varies across the 12 DOE sites, according to Bradbury and Branch (1999) thus raising some questions about the actual policy influence of the CAB process. Perhaps the most important product of the CAB concept for policy change, however, is the institutionalization of stakeholder participation in the environmental cleanup and compliance mission. In this regard, grassroots groups have an organizational platform within the cleanup policy framework from which to provide input and oversee the process (Walpole interview, 2000).

The Revolving Door: Outsiders Become Insiders

Members of grassroots organizations were not the only ones who found a place at the DOE's decision making table. One of the interesting developments that occurred after 1986 was that some prominent policy outsiders became insiders. For example, John Ahearne, who was vice-president of Resources for the Future during the mid-1980s, was appointed as Chairman of the DOE's Advisory Committee on Nuclear Facility Safety in 1987. In that capacity, Ahearne was intimately involved with the controversial issues surrounding the shutdown of military reactors at the Savannah River facility in 1988. Also, Dan Reicher, an attorney with the NRDC and co-author of the *Nuclear Weapons Databook*, served in several deputy assistant secretary posts at the DOE beginning in 1991.

Although the movement of outsiders to key positions inside the policy structure was limited to a small number of cases, it was nevertheless evidence that a transformation was underway where the procedures and rules upholding the institutional structure were being transformed in a way which created a more permeable structure. Given the mission changes at the DOE, as well as the emerging commitment to environmental compliance and cleanup, the rules governing who could participate in the policy process had changed.

The Courts as Policy Battleground

As we saw in chapter 5, the federal court system served as a venue for successful action directed at policy reform. Reform proponents were able to successfully utilize the Federal court system in an effort to compel the ERDA/DOE to abide by the National Environmental Policy Act's environmental impact statement requirements as well as the hazardous waste requirements under the Resource Conservation and Recovery Act. Indeed

the federal courts provided the most important policy reform successes prior to 1986 and established precedents that would shape future litigation.

Table 6.6 presents an illustration of litigation in the federal courts involving nuclear weapons production policy from 1986 through 1994. As they had been in the early 1980s, policy reformers were again successful in compelling DOE to abide by the EIS requirements of NEPA. Perhaps more interestingly, few of the NEPA cases were resolved in court because the DOE agreed to prepare the EIS and forego what would have probably been an inevitable court order. In addition, there was some speculation that the desire to cultivate a more positive public image was a motivating factor for DOE decisions to prepare EIS without a court order. Moreover, some key members of Congress were instrumental in urging the DOE not to fight the EIS litigation out a desire to avoid long and costly delays in resuming weapons production operations. Finally, other policy reform success was achieved in compelling DOE to abide by the hazardous waste regulations of the Resource Conservation and Recovery Act (Dycus 1996, Holt 1990).

Table 6.6: Nuclear Weapons Production Policy Litigation, 1986-1994

Case	Subject and Outcome
NRDC v. Herrington (1987)	Suit over DOE failure to prepare EIS for N reactor restart at Hanford. Case dismissed as moot after reactor indefinitely shut down.
Sierra Club v. DOE (1987)	Lack of adequate environmental assessment for test burn at mixed waste incinerator at Rocky Flats. DOE agreed to perform assessment.
ERF v. Watkins (1988)	Suit over DOE failure to prepare EIS for restart of Savannah River production reactors. DOE agreed to prepare EIS and not restart reactors before issuing record of decision.
NRDC v. Watkins (1989)	Suit over DOE failure to prepare programmatic EIS for modernization and cleanup of nuclear weapons production complex. DOE agreed to prepare PEIS.
NRDC v. Watkins (1989)	Inadequate EIS for construction of Special Isotope Separation plant at Idaho National Engineering Laboratory. Case dismissed as moot when the project was cancelled in FY1991 budget request.

Washington v. U. S. (1989)	Suit initiated over Washington State's 1986 effort to impose penalties against DOE's Hanford operations under RCRA. Suit dismissed because Court ruled that Congress had not expressly waived sovereign immunity from state imposed civil penalties under RCRA.
Sierra Club v. DOE (1990)	Appeals Court ruled that hazardous waste mixed with plutonium at Rocky Flats facility is subject to Federal and state regulation under RCRA.
Sierra Club v. DOE (1991)	DOE ordered to obtain RCRA permit to store hazardous waste mixed with plutonium at the Rocky Flats facility.
Ohio v. U.S. DOE (1992)	Suit initiated over Ohio's 1986-88 effort to impose penalties under RCRA against DOE's Fernald operations. Ohio suit dismissed because Court ruled that Congress had not expressly waived sovereign immunity from state imposed civil penalties under RCRA.
NRDC v. Watkins (1992)	Suit aimed at obtaining DOE compliance with the Clean Water Act at the Savannah River facility. DOE agreed to complete cooling tower prior to reactor restart.

Table 6.6 also indicates that one of the important roadblocks standing in the way of policy reformers was the issue of sovereign immunity. Both Washington and Ohio initiated litigation seeking civil penalties against the DOE over pollution and contamination at the Hanford and Fernald facilities. Other weapons production host states filed amicus curiae briefs supporting the Washington and Ohio position. Both efforts were rebuffed in the federal courts which upheld the concept of sovereign immunity from state imposed penalties imposed for statutory violations. The court determined that clear congressional intent to waive sovereign immunity from state imposed civil penalties could not be found in the Clean Water Act or the Resource Conservation and Recovery Act (Dycus1996).

Provoked in part by the Federal Court decisions, and after heavy lobbying by the National Governor's Association and the National Association of Attorney's General, Congress passed the Federal Facility Compliance Act of 1992. The FFCA expressly waiving sovereign immunity for RCRA violations at DOE weapons production sites, and allowing states to impose administrative orders against federal agencies to enforce

compliance with Federal, state and local hazardous waste regulations (Dycus 1996, Hourcle and McGowan 1993).

Not listed in Table 6.6 are numerous workman's compensation and wrongful death lawsuits aimed at nuclear weapons production contractors. According to local newspaper content analysis this litigation was prevalent at the Rocky Flats, Fernald and Hanford facilities. The suits were generally acrimonious with contractors arguing that conclusive proof of wrongful death could not be proven given numerous scientific uncertainties while grieving families and local authorities offered up emotional and anecdotal evidence. Nevertheless, many cases were resolved by cash settlements awarded to surviving family members by weapons production contractors who, though not offering admissions of guilt, were often prodded by the DOE to resolve outstanding cases and avoid protracted conflicts which might negatively affect DOE's attempt to rebuild its public image (Blum 1990, Lavelle 1989).

Arms Controllers: The Issue of Supply and Demand

As we saw in chapter five, a long-running nuclear arms control proposal had focused on placing restrictions on the production of nuclear materials. Since first being introduced in Congress in 1975, however, the idea had gained little support. The policy reformers who could be grouped under the heading "arms controllers" seized on the changes in the international situation, as well as the problems plaguing the nuclear weapons complex, as the impetus for renewing the drive to restrict nuclear materials production.

Although arms control and environmental organizations clearly shared common policy reform interests, a united front did not develop until late 1987 when a coalition of eight national groups issued the "Plutonium Challenge." Using the ES&H problems in the

weapons production complex as the pretext, the proposal called for the U.S. to begin a two-year moratorium on plutonium production and negotiate a bilateral, verifiable nuclear materials production cutoff. The “Plutonium Challenge” proposal represented a common ground between groups who favored restrictions in nuclear materials while facilities were temporarily shut down, and those who desired to see production facilities closed altogether (Lanouette1989). With the easing of Cold War tensions the appeal of restricting nuclear materials production gained momentum in Congress and in 1989 the International Plutonium Control Act was attached as an amendment to Defense Department’s FY1990 authorization bill. The amendment called for the Bush administration to study a production cutoff and report to Congress on how bilateral cuts could be verified (Lanouette 1989).

Although DOE officials warned of unilateral disarmament if a materials cutoff came to fruition, arms control proponents were able to effectively rebut such notions by pointing to the Natural Resource Defense Council’s *Nuclear Weapons Databook* (Marshall 1987c). The multi-volume analysis of U.S. nuclear weapons programs indicated that materials stockpiles were at the very least sufficient for several years into the future. Moreover, the argument ran, negotiated reductions of nuclear stockpiles would obviate the need for production almost entirely. Even proponents of continued production admitted that deep cuts in U.S.-Soviet nuclear arsenals, roughly 50 percent, would ultimately obviate the need for the production of additional nuclear materials (Wagner1988). According to arms control groups, the reduction in materials needs meant that troubled facilities, such as Hanford and Rocky Flats, could be permanently closed. Ironically, the argument for materials production cutoff was bolstered when technological developments at the DOE’s Lawrence Livermore Laboratory found an effective method for reusing key components of

retired nuclear warheads. The breakthrough appeared to justify both reductions in materials production as well as the closure of key weapons production and processing facilities (Smith 1991).

State Governments

One of the realities of nuclear weapons production policy beginning in 1945 was an absence of avenues for state and local government participation. State government participation in any aspect of nuclear weapons production policy did not become a reality until the Superfund Amendment and Reauthorization Act (SARA) of 1986. Even after SARA's mandate for the development of interagency agreements, states were effectively hamstrung from assessing penalties against the DOE by the doctrine of sovereign immunity. Not until the passage of the Federal Facilities Compliance Act of 1992 were state governments given an effective tool for compelling ES&H compliance at nuclear weapons production sites. Nevertheless, state governments which hosted nuclear weapons production facilities were able to exert greater influence over the ES&H issues at the complex by virtue of their involvement in interagency agreements. Primarily, the influence was exercised during the planning process wherein state governments could essentially veto DOE cleanup proposals that they found objectionable. Often, signs of state opposition to cleanup plans was enough to compel the Department of Energy to revise its proposals to accommodate state wishes. In addition, as the scope and difficulty of the cleanup task emerged, state governments became the driving force to renegotiate interagency agreements once it was clear that the DOE could not meet cleanup milestones. In short, the IAG process allowed state governments a substantial ability to shape the emerging cleanup and compliance policy (GAO 1991b, OTA 1991, U.S. Congress 1988b).

Despite the difficulties of addressing ES&H problems through direct actions with the Department of Energy, state governments were active in pressing the federal government for serious policy change. Much like members of national and grassroots organizations, state and local government officials were well organized to present their reform ideas. Although many individuals from state and local government agencies offered testimony to Congress, two organizations were particularly ubiquitous throughout congressional hearings, particularly those leading to the Federal Facilities Compliance Act of 1992. Members of the National Governor's Association (NGA) and the National Association of Attorneys General (NAAG), representing state attorneys general, testified at 11 of 17 hearings listed in the FFCA legislative history. The principal idea articulated during NGA and NAAG testimony was similar throughout: federal facilities should comply with ES&H regulations like any other entity. It was a compelling message particularly because the national security mission of nuclear weapons production appeared less acceptable as a defense for environmental contamination and threats to public health (CIS Annual 1992).

National Media: Attention and Tone

The following sections focus on the attention and tone of the national media as reflected in content analyses of headlines from the *New York Times* and the *Reader's Guide to Periodical Literature* from 1986-1994. Figure 6.6 illustrates the general coverage found in the *New York Times*. The figure illustrates a massive increase in attention in 1988 and 1989 when the full scope of ES&H problems in the nuclear weapons production complex became widespread knowledge for the general public. Many stories during these two years were front-page features. In addition, 1989 was James Watkins' first year as DOE Secretary

and the year was punctuated by a constant string of events that garnered substantial media attention.

Perhaps not surprisingly, the *New York Times* coverage dropped significantly starting in 1991 as the environmental cleanup and compliance policy began to take shape. While the new cleanup and compliance policy was often controversial, particularly as the scope of the problem expanded and as cleanup plans were debated, there was a significant lack of what might be termed as explosive news until the revelations associated with radiation experimentation were released in 1994 during Secretary O’Leary’s “Openness Initiative.” Reports of accidents and mishaps, a near constant occurrence during the 1970s and early 1980s, disappeared from the *New York Times* primarily because most of the major industrial components of the production complex were no longer in operation after 1989-90.

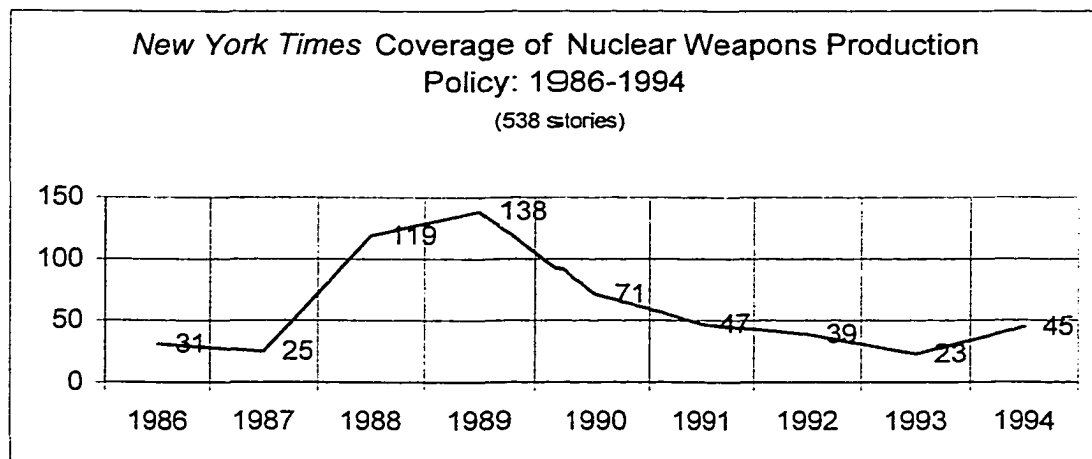


Figure 6.6: *New York Times* Attention, 1986-1994

Figure 6.7 illustrates the tone of coverage found in the *New York Times* and was decidedly negative. Much like the tone of attention during the period 1970-1985, the stories covered by the *Times* were rarely about positive developments. The news, particularly through 1989, generally focused on the emerging story of ES&H problems in the nuclear

weapons production complex, or revelations about previously secret production issues found in government and policy reform organization reports and from whistleblower testimony.

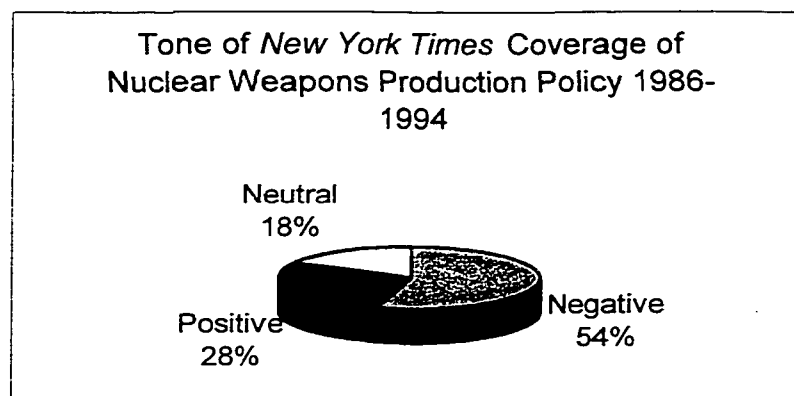


Figure 6.7: *New York Times* Tone, 1986-1994

Figures 6.8 and 6.9 illustrate the attention and tone of headlines found in the *Reader's Guide to Periodical Literature*. The attention and tone of the *Reader's Guide* essentially mirrors that of the *New York Times*: attention peaked during 1988-89 and declined thereafter, and was characterized by an overwhelmingly negative tone.

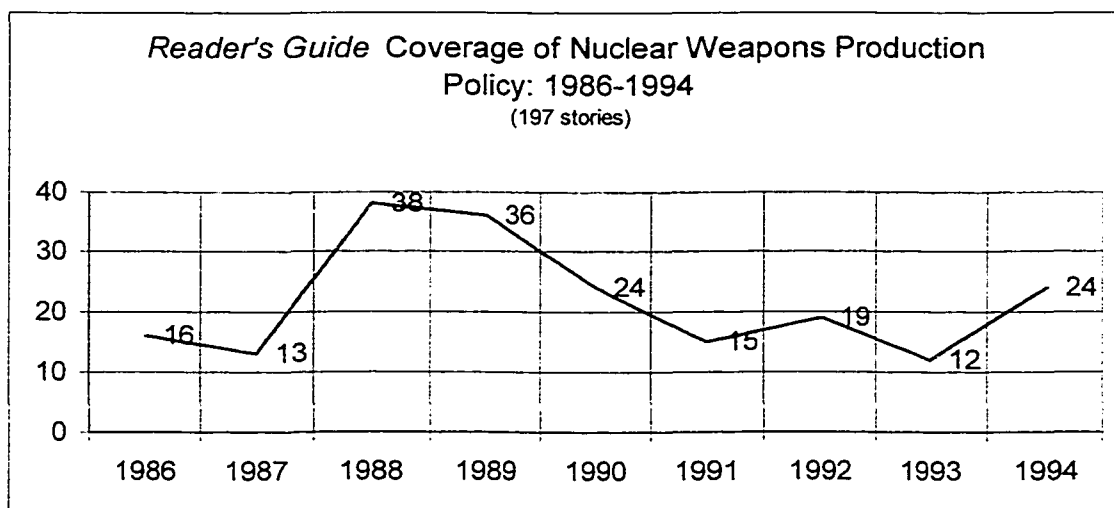


Figure 6.8: *Reader's Guide* Attention, 1986-1994

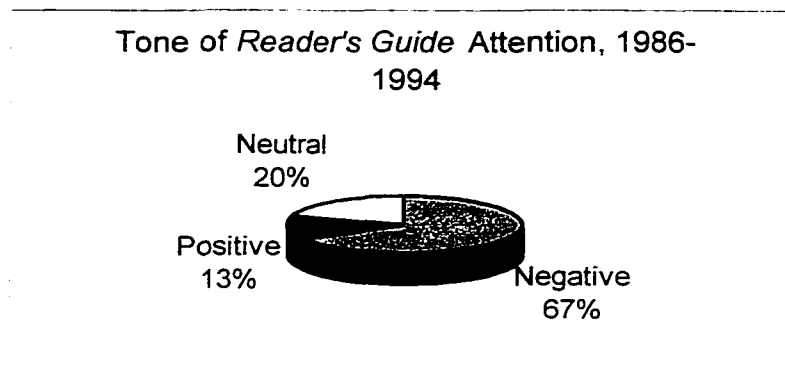


Figure 6.9: *Reader's Guide* Tone, 1986-1994

One of the interesting features revealed by the content analysis of the *Reader's Guide* was the extensive negative coverage of nuclear weapons production policy found in the weekly mainstream press. For example, *Time* magazine's cover story of October 31, 1988 was entitled "They Lied to Us." *Newsweek's* cover story of the same date was entitled, "Nuclear Danger and Deceit." Even periodicals that tend not to cover headline news featured stories on the weapons complex. *Good Housekeeping*, for example, published a story entitled "How I Fought My Own War Over Nuclear Arms." about Lisa Crawford's battle with National Lead of Ohio and the DOE over ES&H problems at the Fernald facility. In short, by 1988-89 the story had expanded from one reserved for the specialized journals, such as *Science* and the *Bulletin of the Atomic Scientists*, to one that had captured the attention of the popular press. Once the furor over the ES&H problems began to recede in 1990 the story appeared only infrequently in the mainstream press and was found once again in the more specialized journals that had maintained a consistent focus on nuclear weapons production policy since 1970.

Local Media Attention and Tone

The following sections present illustrations of local media attention and tone from 1986-1994. The figures presented below were constructed according to the same set of criteria as used in chapter five.

Figure 6.10 illustrates the coverage by the *Denver Post* of nuclear weapons production policy. The most notable feature of the figure is the high peak of coverage during 1989. After a gradual buildup of coverage, Rocky Flats became an almost daily story in the *Denver Post* in 1989. During that year Rocky Flats was a prominent story because of several major events including the June FBI raid, which ultimately led to the shutdown of the plant, changes in the facility's prime contractor, and the listing of Rocky Flats on the Superfund National Priority List. Prominent news items declined as the most conflictual and explosive controversies died down after the 1989 uproar, Rocky Flats nevertheless remained a significant news item through 1994.

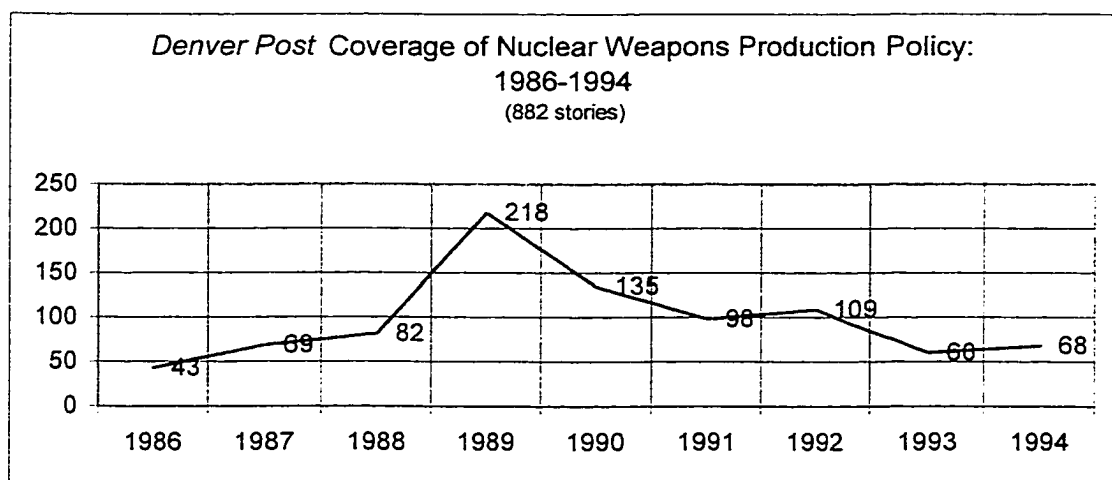


Figure 6.10: *Denver Post* Attention, 1986-1994

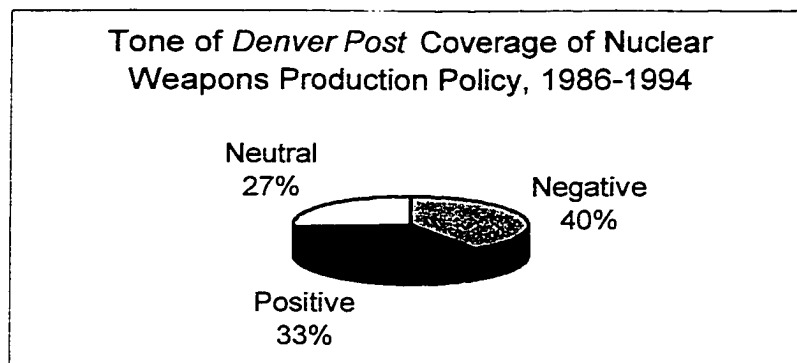


Figure 6.11: Tone of *Denver Post* Coverage, 1986-1994

One notable change in the tone of the *Denver Post* attention to nuclear weapons production policy compared to the period 1970-1985 was the decrease in the proportion of negative coverage, from 53 to 40 percent, and an increase in positive coverage from 16 to 33 percent. Although the Rocky Flats story certainly remained controversial through 1994, the content analysis indicates that the tone of coverage was more positive primarily because of the implementation of environmental cleanup and compliance measures at the facility.

Figures 6.12 and 6.13 illustrate the attention and tone from the content analysis of headlines from the *Cincinnati Enquirer* from 1986-1994. Obtaining the complete data set was not possible as indicated in Figure 6.12. Despite the gap in the latter part of the record, the figure illustrates that attention to the Fernald facility was particularly high from 1986 through 1989. The extensive coverage was due to the controversy at the facility, controversial changes in the prime contractor, litigation over worker deaths, and the change in the facility's mission from production to cleanup. Although coverage tapered off after 1989, Fernald was still a significant news item as the implementation of the cleanup process began.

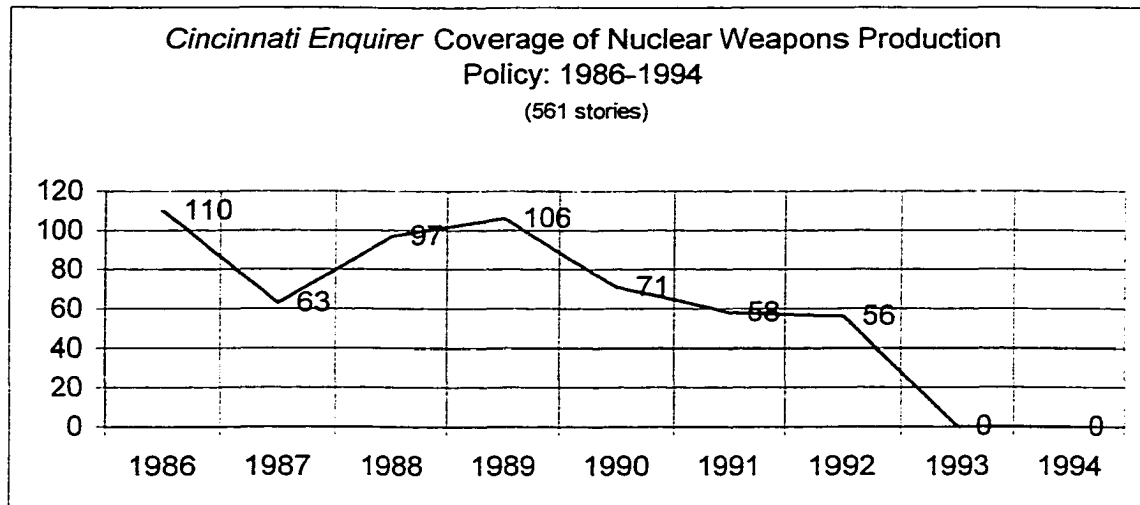


Figure 6.12 *Cincinnati Enquirer* Attention, 1986-1994

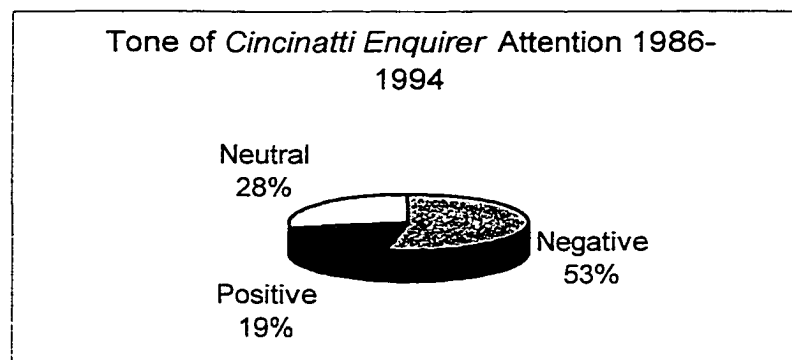


Figure 6.13: *Cincinnati Enquirer* Tone, 1986-1994

Figures 6.14 and 6.15 illustrate the attention and tone from a content analysis of headlines from the *Seattle Times*. The attention peaked in 1986 after the release of previously declassified documents and in the wake of the concerns over the safety of the N reactor following the Chernobyl fire. Coverage dropped off until rising again in 1990 and 1994. A notable feature of the *Seattle Times* attention to nuclear weapons production policy compared to the other two local media sources is its limited coverage. One possible explanation for this spare coverage is a shortcoming in data collection. The database

appeared to contain gaps where the Hanford story did not appear at all. A second explanation might be the proximity of Seattle to the Hanford Reservation. Denver and Cincinnati average about 15 miles from the Rocky Flats and Fernald sites respectively, while Seattle is over 150 miles from the Hanford Site, a fact that might have affected coverage. Finally, it appears likely that once the furor over the historical documents release and the N reactor safety status subsided, coverage rose and fell according to specific events at the reservation.

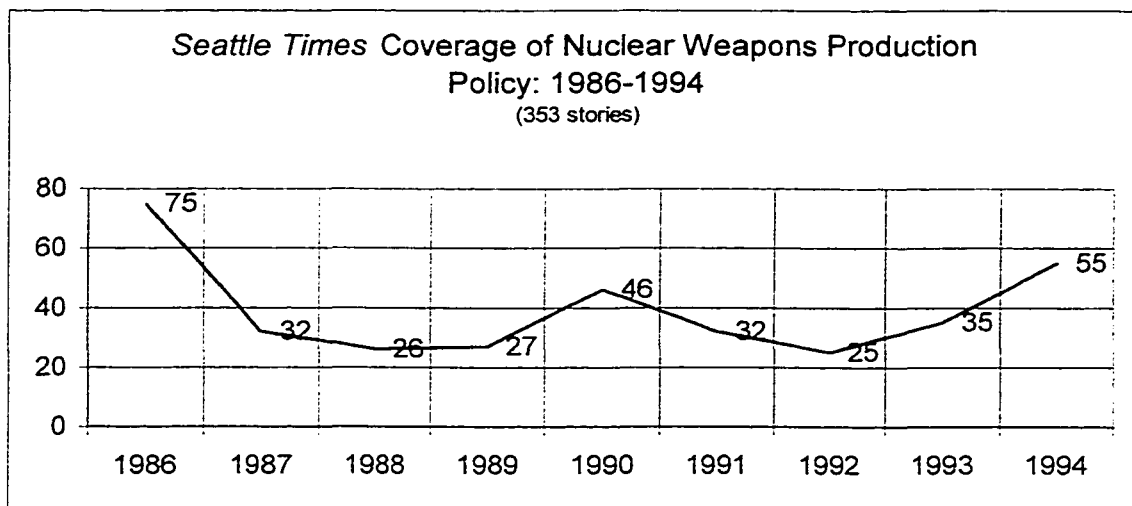


Figure 6.14: *Seattle Times* Attention, 1986-1994

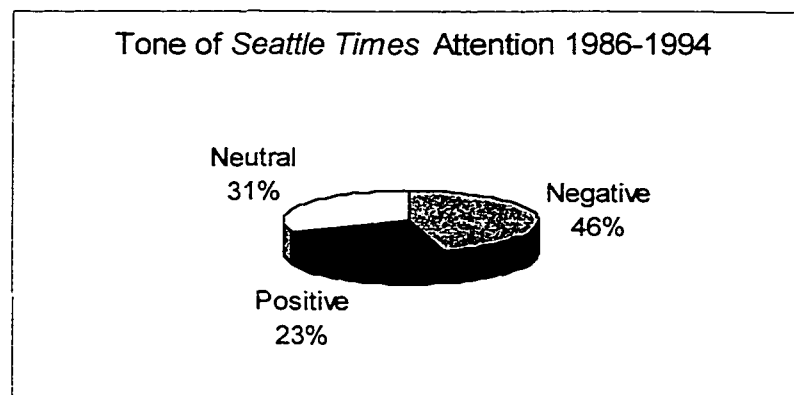


Figure 6.15: *Seattle Times* Attention, 1986-1994

One interesting feature of the tone of local media coverage of nuclear weapons production policy was the consistency of the negative tone, despite efforts being made toward environmental cleanup and compliance beginning in 1990. The negative tone lingered in the local media primarily because local organizations shifted their efforts from criticizing the DOE's inaction, to criticizing its cleanup efforts. As the section on the Citizen Advisory Board concept illustrated, many reform group members had a place at the policy making table and shifted their role of policy reformer to one of oversight of the cleanup process. As such they were able to direct local media attention toward real or perceived shortcomings in the evolving cleanup and compliance policy. Given the uncertainties and challenges of the cleanup process, plans were delayed and redrafted, thus contributing to a generally negative tone of local media coverage.

Conclusion

The pace of nuclear weapons production policy change between 1986 and 1994 was extraordinary. In 1986 changes in nuclear weapons production policy were only slowly emerging. By 1994 an entirely new policy was in place and the monopoly that had been in place for over 40 years had been dismantled. In between, the impetus for change came from many different sources both internal and external to the policy monopoly.

The Chernobyl disaster of 1986 proved to be a critical event for nuclear weapons production policy. Not only did the accident serve as a focusing event, especially for Congress, the analytical process generated by the accident battered the image of nuclear weapons production policy with an official and unbiased stamp of disapproval. In responding to the post-Chernobyl analysis, Congress embarked on a course of action which resulted in the creation of entirely new institutional structures. Chernobyl also stimulated

the elevation of national media attention, although local media attention was dictated by events and developments at site-specific locations.

Change in nuclear weapons production policy was generated from sources both exogenous and endogenous to the policy monopoly. As they had been prior to 1986, court rulings were an important source of policy change, particularly where the DOE claimed either an exemption from ES&H regulations or attempted to utilize a unique understanding of those regulations. Change also came from Congress, which was more active in the period after 1986. Key legislation emerged which fundamentally changed the structure of the policy monopoly. Moreover, much of the change came from within the DOE, particularly after James Watkins became secretary in 1989. Finally, changes in the international situation reduced the need for nuclear weapons and played an important role in altering the DOE's mission from production to cleanup and compliance. It should be reasonably clear, however, that had the Cold War continued for another decade, efforts to implement ES&H compliance would have created a much different policy. Important elements of policy change with regard to ES&H compliance were well in place by the time the Cold War was officially declared over.

Chapter VII: Summary and Conclusions

The story of change in nuclear weapons production policy is remarkable.

Considering the structural stability of nuclear weapons production policy for nearly four decades after World War II, coupled with the image that nuclear weapons production was vital to U.S. national security, the changes that occurred were significant. The fact that the changes took place during a brief period of time after decades of stability, appears to confirm the theory that despite the stability of the American political system, it is susceptible to dynamics which can usher in dramatic change.

By way of a brief summary, several key examples illustrate the changes that occurred in nuclear weapons production policy. First, the policy itself changed from one oriented toward the production of nuclear materials and weapons to one focused on cleaning up the physical legacy of production and complying with federal and state environmental, safety and health regulations. While the production mission change was perhaps the most obvious, it is the contention of this paper that the overall mission change was essentially the culmination of numerous streams of policy change and came after other, perhaps more subtle changes, were in place or well underway. In short, had the Cold War continued for another decade or so, nuclear weapons production policy would have been increasingly characterized as having significant environmental, safety and health considerations.

Before the production mission was drastically scaled back at the end of the Cold War, gradual changes were found in complying with federal and state environmental,

safety and health regulations. Court rulings, coupled with pressure from Congress, compelled the AEC/DOE to comply with the National Environmental Policy Act as well as the Clean Water Act. Federal legislation, namely the Superfund Amendment and Reauthorization Act of 1986, established a policy framework designed to address the challenges of cleanup and ES&H compliance. Even before SARA, the DOE had begun the cleanup of defense wastes on a limited basis. In short, a greater emphasis on environmental compliance was evolving several years before the mission was shifted away from nuclear weapons production.

Third, as the cleanup and compliance component of nuclear weapons production policy emerged there was an expansion of activity by political entities that had previously been excluded. By virtue of avenues created by federal laws (namely interagency agreements) state governments and other federal agencies attained a position in the institutional framework where they could shape the emerging cleanup policy. As a result, the cleanup process itself became more transparent to greater public oversight and scrutiny. The transparency was aided, in part, by the release of previously classified documents and information about weapons production activities.

Fourth, policy change was manifest also in organizational changes. Under the direction of Secretary James Watkins, the Department of Energy initiated a reorganization to include a dedicated environmental management function as well as efforts to improve the structure and process of communication across the entire organization. Furthermore, the organizational changes necessitated a shift of budgetary resources to the growing requirements of cleanup and compliance. In addition, the

cleanup policy necessitated organizational changes in other federal agencies and in state governments who were parties to cleanup agreements.

Finally, changes were manifest in the nature of the relationship between the government and its facility management and operations contractors. During the period of the “production imperative,” environmental, safety and health values were de-emphasized leading to widespread contamination problems. Changes in the incentive structure of contracts placed a greater emphasis on environmental, safety and health matters and the contractors themselves were oriented primarily toward cleanup rather than materials and weapons production.

Political Dynamics Over Time

The story of change in nuclear weapons production policy is also expansive. One of the general findings of this study was that policy change occurred over a considerable length of time. By examining nuclear weapons production policy over a 50-year period, this analysis developed a better perspective of the divergent and complex origins of change and the large and small-scale dynamic forces that impacted the policy. Tracing policy change over a considerable period of time was particularly helpful for understanding the impact of images on nuclear weapons production policy change.

In this study, key images such as patriotism and the predominance of national security over other values underwent a transformation, as did the issue of public trust in government. These images had been the bedrock foundation of nuclear weapons production policy for the 25 years following World War II, but were in flux by the late 1960s. John Glenn’s statement (see Chapter I) perhaps best summarized the change in attitude about how other policy values had emerged to compete with national security.

Prior to the 1970s, national security was a predominant value across many segments of society and its position was essentially unchallenged. The vigor with which the Atomic Energy Commission and the Joint Committee on Atomic Energy pursued their national security mission was a clear illustration of how other policy values such as environmental, safety and health, were relinquished in order to meet military requirements. The longitudinal approach used in this study illustrated that well before the Cold War ended, ES&H values had grown in importance across society more generally and were increasingly challenging the preeminence of national security and nuclear weapons production policy.

The longitudinal approach of this paper also shed light on the issue of public trust in government and how shifting perceptions and images affected nuclear weapons production policy change. Again, trust in the institutions responsible for nuclear weapons production, indeed a general sense of trust in government, was an essential component of the policy monopoly. Yet when public trust began to erode, first over radiation exposure, and later over the hazards of living near or working in the production complex, a serious credibility problem emerged. The result, as interviews and published materials clearly indicated, was the idea that institutions such as the Atomic Energy Commission and the Department of Energy could not be trusted to properly balance the values of national security and environmental, safety and health. Perhaps as much as the physical residue of nuclear weapons production, the violation of public trust will be a more difficult legacy to cope with.

The longitudinal approach utilized here also proved itself useful for understanding the development of institutional structures, many of which emerge from varied sources

over a relatively slow period of time. Of course, underlying the emergence of institutions is the development of ideas and the process whereby ideas rise or fall in popularity in important political venues. Examining such venues as Congress, court systems, state governments, and local and national media allowed us to follow the actions of these venues regarding nuclear weapons production policy over several decades. Moreover, a study approach that covers 50 years provides an opportunity to follow the development of ideas that were debated over the course of several decades, and how ideas are translated into institutional structures that spawn policy change. For example, the key ideas of federal facility environmental compliance, and independent oversight of the weapons production process, began to reach policy agendas by 1970 and gradually matured over the next 25 years.

Endogenous and Exogenous Sources of Policy Change

Not only did policy change occur over many years, but its sources were diverse. The dynamics of policy change came from both outside and inside the policy monopoly. The study of nuclear weapons production policy illustrates the varied nature of origins of policy change thus confirming the need to cast a wide net when searching for the origins and dynamics of change.

In this study, exogenous forces of change were found in macro-political institutions, particularly the federal courts. The federal courts handed down key rulings that produced important precedent (*NRDC v. AEC*, 1973), directly induced policy change (*LEAF v. Hodel*, 1984), or prompted other political actors to respond with actions of their own (*Ohio v. U.S. DOE* 1992). State-level courts also played a role in the process of policy change by issuing rulings in worker death cases that negatively impacted

prevailing policy images. It is interesting to note that the cases reviewed for this study indicate that the federal courts were able to change both structure and image, while state courts appeared to have influence only in the area of altering policy images.

Another important macro-political source of policy change was Congress, which produced several key pieces of legislation that either created entirely new or altered existing institutional structures of the weapons production policy monopoly. With respect to Congress as a source of policy change, we should also be aware that congressional influence over policy change is not merely found in new pieces of legislation. On several occasions, pressure from key members of Congress was critical for prompting DOE to abide by regulatory requirements and in compelling DOE to meet the requests of environmental organizations rather than face inevitable litigation.

Policy change was also stimulated by international events. The Chernobyl accident served as a focusing event for nuclear weapons production policy, and the reduction and eventual end of Cold War tensions acted to completely alter the policy from weapons production to environmental cleanup and compliance. Given the fact that international events played a central role in the initial establishment of the weapons production policy monopoly, it should come as no surprise that they also played a part in its eventual demise.

The dynamics of policy change also originated from within the policy monopoly. In particular, the actions of DOE Secretary James Watkins were critical for change. Watkins initiated widespread change within the DOE initially to meet the ES&H crisis, and later to ensure that the DOE maintained a firm grip on the emerging cleanup and compliance mission. By creating new organizational forms, revamping the

communications structure at DOE, altering contract incentive structures, and attempting to instill a new organizational culture, Watkins tenure at DOE was characterized as a period of dynamic policy change, much of which was initiated by Watkins himself.

Political Conflict and Venue Shopping

In the effort to expand conflict and obtain key allies, policy reformers seek out political venues where they can successfully present their reform ideas and achieve some degree of success. This study demonstrated that reform oriented forces followed a strategy of venue shopping. During the 1970s, national and grassroots environmental organizations were unable to effectively access Congress to press their case for changes in nuclear weapons production policy despite the series of accidents that beset the complex. In addition, state governments were not an appropriate venue for conflict expansion simply because those governments had little recourse of action beyond mostly symbolic action (e.g., conducting policy analysis and convening study panels). Policy reform groups, however, were able to access the federal court system and achieve significant victories in the area of environmental compliance. Interest group influence in nuclear weapons production policy change was manifest in the ability to not only place ES&H issues on the court's agenda on several occasions, but to be persuasive enough, through argumentation and the presentation of evidence, to achieve favorable court rulings (see Tables 5.9 and 6.5). In short, interest group influence in policy change is demonstrated by both access to important political venues and the subsequent outputs.

It is important to remember also that venue shopping depends on the degree to which venues are accessible to policy reformers. In the absence of the institutional structures created by environmental legislation, reform-oriented groups would have had a

difficult time shopping for appropriate political venues where they could press for change. Yet because of the participatory mechanisms, as well as action forcing structures of environmental policies (e.g., the environmental impact statement requirement of NEPA), policy reformers had both direct access to decision making processes, and opportunities to compel federal agencies to adhere to the letter of the law.

Performance of the Model

The punctuated equilibrium model appears very promising for explaining policy change. The following sections examine the hypotheses that were posed in chapter three and designed to test the utility of the model. Although some of the hypotheses are conceptually related, they will be examined singly.

H 1: The inclusion of new ideas on policy agendas is associated with the development of new institutional structures and arrangements.

The essential relationship here is that as new ideas come onto policy agendas new institutional structures and arrangements will be the result. In the case of nuclear weapons production policy, three related ideas appeared to have played the most significant roles in stimulating new institutional structures and arrangements. First, the general idea of environmental protection was a macro scale phenomenon and stimulated the development of a host of new institutional structures and arrangements. As noted in Table 5.1, the statutes produced during the period 1970-1985 established a framework that encompassed a wide variety of policy areas, including national security programs. Although specific measures directed at environmental protection in nuclear weapons production policy were generally left to AEC/DOE discretion, the existence of that gap in

the regulatory structure paved the way for another important idea that produced new institutional structures.

Another important idea stimulating policy change was federal facility compliance. Although the growing ES&H regulatory structures encompassed an ever widening set of activities and entities, including the federal government, some federal facilities (i.e., nuclear weapons production facilities) remained outside the regulatory framework. As the ES&H problems of nuclear weapons production policy became more troublesome, however, the regulatory gap became more evident, and therefore a focus for reform action. Although nuclear weapons production policy compliance with federal and state ES&H regulations was debated in the case of *COPIRG v. Train* (1976), it did not fully mature until the 1992 Federal Facility Compliance Act. The essence of the reform idea was not simply the general concept of federal facility compliance, but that national security policy, including nuclear weapons production policy, should not remain immune from ES&H regulations. Given the dominant stature of national security policy, it is remarkable that the idea of environmental compliance was able to penetrate this bastion of public policy and essentially expand its boundaries to include an ES&H component (Dycus 1996).

The third important idea at work in nuclear weapons production policy change, and closely related to federal facility compliance, was the idea of independent oversight of ES&H dimensions of the production process. The ideas of environmentalism and federal compliance carried little weight as long as AEC/DOE self-regulatory powers were intact. Because the cause of the ES&H problems was seen by many as resulting from self-regulation, the idea of independent oversight of weapons production steadily grew in

popularity and eventually became a major element of the policy debate after 1986. In many respects, the development and application of regulatory structures for nuclear weapons production policy was an extension of the growth of regulation across society more generally where an entity responsible for a product or service, including a federal government agency, could not of its own accord be assured of properly balancing competing values, and therefore required some degree of oversight.

As the ideas of environmentalism, federal facility compliance and independent oversight were processed on policy agendas, the result was the development of a set of new institutional structures and arrangements. Some of the arrangements and structures were generally applicable, such as NEPA's environmental impact assessment process. Others were focused specifically on environmental, safety and health components of nuclear weapons production policy, such as the interagency agreements mandated under SARA, the oversight authority of the Defense Nuclear Facilities Safety Board, or the legal protections extended to whistleblowers. No less important structures and arrangements included changes in radiation health authority, the establishment of modernization and cleanup planning processes, changes in contract incentives and the creation of the Office of Environmental Management at the DOE to achieve ES&H compliance goals. The eventual policy decisions produced by these new institutional structures and arrangements effectively dismantled the policy monopoly because new political entities were given new avenues for participation in the previously closed decision making system.

H 2: The creation of new institutional structures and arrangements is associated with increased participation by previously excluded institutions or groups.

As new institutional structures and arrangements emerged, doors were opened to previously excluded parties. For example, the interagency agreements mandated under SARA allowed the Environmental Protection Agency, state-level agencies and Indian tribes to participate in the development and implementation of cleanup plans at weapons complex sites. Essentially these non-monopoly entities served in an oversight capacity in the developing cleanup and compliance policy. As the cleanup process matured, the Citizens Advisory Board concept was created allowing local citizens and members of grassroots organizations regular access to planning and oversight processes at specific DOE sites. In addition, the creation of new structural relationships in radiation health authority produced avenues for the Department of Health and Human Services and independent researchers to have unprecedented access to data and previously unobtainable information.

Perhaps the most interesting result of new structures and the increased participation of previously excluded players is that it illustrates the development of “presence politics” (Bosso 1987) where structural changes create avenues for political participation. The structure of policy making is essentially an institutionalized pluralism where opposition forces gain access to decision-making processes on a more or less permanent basis. The extent to which this institutionalized pluralism shapes environmental cleanup and compliance policy at nuclear weapons production sites is beyond the scope of this paper, but the large roster of participants is a reflection of similar circumstances in other areas of public policy.

H 3: *As media attention to an existing policy increases, there will be an increase in the negative tone of media coverage.*

The relationship between an increase in media attention and the negative tone of attention is somewhat difficult to establish primarily because so much of the coverage dealt with topics that could only be coded as negative. Perhaps not surprisingly, what drove media attention to nuclear weapons production policy was conflict and controversy. The plethora of accidents and mishaps in the weapons complex, the battle over cancer studies and health risks, and the protest activity that took place at production sites were generally negative events that were reflected in the content analysis of both national and local media sources. With few exceptions, neutral stories outnumbered positive ones in both study periods across both national and local media sources. Media tone did not necessarily shift from positive to negative in this analysis, but was overwhelmingly negative during the entire twenty-five years from 1970-1994. Essentially what occurred was that as the ES&H controversy expanded the consequent media attention also expanded. Because of the nature of the ES&H issues, and the number of events occurring, the negative tone of media coverage expanded accordingly.

H 4: *As congressional attention to existing policy increases, there will be an increase in the negative tone of congressional attention.*

Based on the content analysis of available congressional hearings, two related dynamics drove congressional attention and tone. The first dynamic was the ES&H controversy that swept across nuclear weapons production policy. As illustrated by Figure 6.2, the majority of congressional hearings during the period 1986-1994 focused

on environmental safety and health issues of nuclear weapons production policy.

Because the ES&H dimensions of the policy were undeniably negative, according to the available information, the congressional inquiry was characterized by a generally negative tone.

The second dynamic that drove congressional attention and tone were the witnesses who gave testimony during the hearings. The large numbers of policy reformers who testified before Congress, particularly after 1986, contributed to the negative tone of the hearings. Moreover, experts who gave testimony, but who were not members of either the policy monopoly or reform oriented groups, generally gave testimony that was of a negative tone.

H 5: As a policy image becomes more negative there will be an increase in the number and type of committees and subcommittees attempting to gain a jurisdictional foothold.

In focusing on Congress as a source of policy change, the evidence indicated that congressional action was not forthcoming until non-policy monopoly committees became involved in the debate. As long as armed service and appropriations committees were controlling the policy debate, change occurred at an almost imperceptible pace. Once other congressional committees established a foothold in the widening debate, however, the pace of policy change, based on legislative outputs, accelerated rapidly.

As the policy image grew increasingly negative after the Oak Ridge and Savannah River controversies in 1983, and particularly after the Chernobyl accident in 1986, there was an expansion in the number and type of congressional committees holding hearings.

Armed service committees were unable to contain the growing debate, and other key panels such as the Senate Government Affairs Committee and the House Energy and Commerce Committee became vigorously involved. The concept of “attempting to gain a jurisdictional foothold” is measured by the proliferation of committees holding hearings on nuclear weapons production policy. As illustrated by Table 6.1, between 1986-1994, non-policy monopoly committees in both the House and Senate held twice as many hearings as did policy monopoly committees. In addition, the concept of jurisdictional foothold can be found in the legislative history of the 1992 Federal Facility Compliance Act where non-policy monopoly committees dominated the proceedings and played the central role in shaping the legislation (see Table 6.2).

Part of the explanation of the expansion in the number and type of committees involved in the debate over nuclear weapons production policy can also be found in the motivation of different members of Congress whose states or districts hosted nuclear weapons production facilities. As we saw in Chapter VI, John Glenn’s position as chairman of the Senate Government Affairs Committee allowed him to convene regular hearings on weapons production policy. Based on a review of congressional hearings and legislative activity, other members of Congress, such as Representatives David Skaggs (D-CO), Gus Luken (D-OH) and Ron Wyden (D-OR), along with Senators Howard Metzenbaum (D-OH) and Tim Wirth (D-CO), took a particularly active role in the policy debate by virtue of their positions on committees that became heavily involved in the conflict over ES&H issues. These members undoubtedly held a complex mixture of motivations to become involved in the policy debate, not the least of which was the interest in responding to the concerns of their constituents.

H 6: As the social aspects of a policy issue become more prominent, a broader range of congressional committees and subcommittees become involved in the issue conflict.

According to the punctuated equilibrium model, congressional committees that are a component of a policy monopoly have an incentive to prevent the spread of political conflict that might threaten their policy jurisdiction. If political conflict over issues can be contained, committees can maintain their grip on the dimensions of the debate. Until the period 1983-85, the policy debate was relatively well contained and restricted primarily to the joint Committee on Atomic Energy and armed services committees in Congress (see Table 5.4). These committees were successful at limiting the scope of the growing debate over environmental, safety and health issues of nuclear weapons production policy because they were successful in maintaining the policy definition as one focused on national security. As illustrated in Chapter V, the early congressional hearings on accidents and mishaps in the weapons complex focused on how those events might impact production schedules and weapons deliveries rather than public health and the environment. Once the scope and magnitude of the ES&H problems became better known, however, the political conflict grew in intensity and the issue definition was no longer simply a matter of weapons production schedules, national security needs or appropriations for weapons programs. The key factor, it seems, was that because the ES&H problems touched on public health, the safety of local communities, policy oversight and the trustworthiness of government agencies and their contractors, a larger variety of congressional committees inevitably became involved in the conflict (see Table 6.1).

An additional factor influencing the variety of congressional committees involved in the policy debate was the action of specific members of Congress. Much like we saw in hypothesis five above, the policy interests of individual representatives and senators was a factor in spurring the involvement (i.e., hearings) of a greater variety of congressional panels.

H 7: An increase in internal dissent is associated with the development of a negative policy image.

The policy change literature indicates that the development of political conflict within a policy monopoly can lead to change. In the case of nuclear weapons production policy, internal dissent was identified as coming from several sources. The first signs of dissent emerged from within the Atomic Energy Commission when some of the agency's scientists went public with their concerns over health risks from radiation exposure. The dissent had been brewing for a decade, but remained hidden from public view until the late 1960s. By publicly criticizing the institutional structure and the policy, the AEC scientists were instrumental in fostering a negative image of the Commission and its policies. Similarly, the Mancuso controversy of the late 1970s was also an important example of internal dissent that contributed to an increasingly negative policy image.

In some respects, the internal dissent at the Atomic Energy Commission was a microcosm of a wider social phenomenon where the views of the scientific community became fractured along complex lines dealing with public safety and the wisdom of developing some forms of advanced technology. Perhaps most importantly for policy change, some dissenters within the scientific community formed their own organizations (e.g., the Union of Concerned Scientists) and lent their talents to national environmental

organizations (e.g., the Natural Resources Defense Council) who were heavily involved in policy reform efforts. More generally, scientific expertise, even if it was not directly in the service of reform groups, played a major role in shifting policy images (e.g., the Roddis Group empanelled after Chernobyl), suggesting changes in institutional structures, and therefore in contributing to policy change.

Internal dissent also came from individuals who worked in the production complex. Whistleblowers were key sources of negative information about operational practices of nuclear weapons production and greatly contributed to the development of the causal story of deliberate actions and efforts to keep them from the public. In addition, internal dissent also came from the labor unions that grew increasingly wary of the health issues associated with nuclear weapons production. Union members had been strong, if silent, supporters of production policy, but became critics of the DOE as the radiation health issue became more controversial.

As important as the substantive nature of the policy dissent was the effort by the AEC and the DOE to deal with the dissent and its effects on policy image. The clumsy efforts to censor scientists, terminate research contracts and generally squelch negative research findings, deny access to health records and harass whistleblowers, received a great deal of negative media attention and was the subject of rancorous congressional hearings. The effort to counter internal dissent suggested that the agencies had “something to hide” and further damaged the image of the policy and the institutional structure.

It might be possible also to consider some members of the arms control faction as policy insiders. Some of the most articulate spokespersons for arms control ideas,

including limiting the production of plutonium and enriched uranium, were former military officers, weapons designers, or government officials (York 1987). The fact that these insiders were proponents of policy reform raised doubts about the need for both expanding the U.S. nuclear arsenal, as well as expanding the size of the production complex, thereby contributing to the negative image of policy. Moreover, the arguments of these proponents of arms control, as opposed to the arguments of peace and disarmament groups, appeared to carry more influence in Washington by virtue of the prevalence of their testimony offered in Congress. Advocates of limiting nuclear materials were much more likely to testify than were advocates of disarmament.

In the final analysis, the internal dissent that contributed to a negative image of nuclear weapons production policy was not the dynamic of competing power centers within the policy monopoly, for example conflict between proponents of different weapons production processes or between supporters of different types of nuclear reactors. Rather the dissent emerged from the scientific base of the organization where the day to day operations of production took place. Internal dissent can be a complex dynamic, and considering the dissent that took place within the nuclear weapons production policy monopoly, we should be aware of conflict deep within the layers of policy monopolies rather than the conflict that occurs on the surface among the dominant players and receives the greatest amount of public attention.

H 8: As the scope of a policy problem expands, local efforts to change policy increases.

This hypothesis is illustrated primarily by Table 5.7 where state-level venue succession events are displayed. As the scope of the ES&H problems expanded between

1970 and 1985, the issues became a part of state government agendas. Some state governments took a more active role in studying the problems, calling for federal action or taking limited action of their own. The institutional structure of the policy monopoly placed severe restrictions on state government action. Nevertheless, some of the state governments that hosted production facilities took positive steps in the direction of policy change.

Local efforts to change policy were also found at the level of grassroots organizations. The formation of grassroots organizations corresponds with the expansion in scope of the policy problem (see Table 5.8). Interviews and content analysis of local media sources indicate that most grassroots groups formed in the aftermath of local accidents or mishaps. Specific events such as the Rocky Flats fire, the radioactive waste leaks at Hanford, and the uranium dust release at Fernald, served as the catalyst for grassroots activism. Additional groups formed as larger numbers of the local population became aware of the extent of problems at the production complex. Much like state governments, local groups gradually became more politically active as the scope of the problem expanded. In general, however, grassroots groups were limited to policy change tactics of advocacy (testifying to Congress) and direct action at specific facilities. For the most part, the only institutional venue accessible to these groups was the court system, but that approach yielded significant success in the cases of *LEAF v. Hodel* and *NRDC v. Vaughn*. These groups were also successful in state-level courts where wrongful death and workman's compensation cases were argued. These particular cases may not have been as visible at the national level, but were well covered by local media sources which probably contributed to the development of negative policy images.

H 9: Changes in policy image at the local level lead to changes in policy image at the national level.

The accuracy of this hypothesis is somewhat difficult to demonstrate. At the very least, the case of nuclear weapons production policy demonstrates that the development of negative images at the local level preceded that of the national level. The proximity of local populations and media sources to the ES&H problems in the production complex, and the accidents and mishaps that occurred, inevitably focused local attention on nuclear weapons production policy. Moreover, until the mid-1980s, ES&H problems were generally perceived as local rather than systemic problems.

Perhaps a more direct illustration of changing images at the local level leading to changes at the national level is comparing the actions of state-level venues with those of national level venues. As illustrated in Tables 5.5 and 5.7, state governments were pursuing policy change efforts years before the federal government embarked on changing nuclear weapons production policy. Even if we consider the reform-oriented decisions of the federal courts in key cases during the 1980s, state governments were working around the edges of the policy monopoly seeking policy change before the federal government began addressing the ES&H issues of nuclear weapons production policy directly. Even though state governments were structurally limited in their abilities to effect change in the structure of nuclear weapons production policy, they could nevertheless demonstrate that local-level policy images were in flux. For example, the Lamm-Wirth Panel, formed in 1975 to study the conversion of Rocky Flats to non-weapons activities, carried no influence in altering policy structures. Yet the existence and recommendations of the Panel clearly indicated that nuclear weapons production

policy images at the local level had undergone a significant change toward a negative tone. Similarly, Washington's Referendum 40 could not by itself legally remove the Hanford Reservation from the final list of nuclear waste repositories nor alter the institutional structure of the policy monopoly. The vote did, however, signal that the state's populace was aware of problems at the facility, concerned about threats to public health and the environment, and mobilized to take action.

One of the important aspects of the hypothesis is the mechanism, or dynamic, whereby local level negative images would lead to changing images at the national level. One mechanism is congressional representation. In the case of Rocky Flats, Hanford and Fernald, local representatives were actively pursuing policy changes before Congress as a whole focused on the issue. Representatives such as David Skaggs (D-CO), Gus Luken (D-OH) and Ron Wyden (D-OR), and Senators John Glenn (D-OH), Howard Metzenbaum (D-OH) and Tim Wirth (D-CO), played important roles in the battle over policy images by holding hearings, participating in questioning witnesses and inviting reform proponents to testify, and generally pressing DOE to abide by ES&H standards. Moreover, these same individuals were active in the effort to bring about policy change by introducing a variety of proposals that promised significant change for the facilities located in or near their states and districts. The content analysis of local media sources indicates that these representatives were particularly interested in environmental safety and health problems, in contact with national and grassroots organizations, active in Congress by holding hearings, pressing the policy debate and proposing or sponsoring legislation to foster policy change.

H 10: *Shifts from factual disputes to normative arguments over policy definitions are associated with an increasingly negative policy image.*

Illustrating this hypothesis entails a brief review of the development of the definition of the problem and the causal story in order to explicate the normative argument. As information about ES&H problems became public, the definition of the problem shifted away from a debate over the nature of the real or potential risks associated with nuclear weapons production, to one that encompassed a normative dimension. Once the dispute began to include concepts of misplaced trust and deception, the normative issue became the focus of the causal story, and increasingly negative policy images were the result

An important component of the normative argument revolved around the extent to which nuclear weapons production policy should fall outside the scope of emerging ES&H regulatory regimes. The AEC and DOE argued consistently that a policy of self-regulation was the most appropriate means of assuring both national security and public safety. Reformers countered that the policy of self-regulation had evolved into no regulation and had directly contributed to the development of serious ES&H problems. Reformers essentially advanced the argument that even those federal agencies responsible for critical national security mission ought to abide by the same regulations as everyone else. If nuclear power reactors were required to meet strict ES&H requirements, so argued reformers, military reactors and other nuclear weapons production facilities should also. Not only was the policy of self-regulation wrong, argued reformers, but it was also dangerous to public health and the environment.

Policy reformers were not content to accept the notion that the accidents and mishaps, health risks, and ES&H controversies were unavoidable and an acceptable tradeoff for national security. Instead, reform groups argued that the ES&H problems were the product of inadequate policy management by organizations which made concerted efforts to conceal the truth. Moreover, once information about the deliberate releases of radiation and experimentation became public, the causal story took on a sinister dimension wherein the AEC and DOE, in pursuing their national security mission, had in fact endangered the health of the very society they were charged to protect.

Another aspect of the shift from factual disputes to normative arguments concerned the issue of public health risk. Although there was a general debate over health risks, there is no indication that grassroots groups engaged in detailed discussions over such factual disputes as radiation dosage or contaminant parts per million. While some national organizations were involved in a sophisticated effort to determine risks, grassroots groups approached the issue with the assumption that any level of contamination posed a risk. Because of this approach, coupled with a mistrust of the Department of Energy, grassroots groups essentially spearheaded the effort to develop a normative dimension of the political conflict.

Recommendations for Strengthening the Punctuated Equilibrium Model

The hypotheses indicate that the relationships appear to confirm the utility of the punctuated equilibrium model. Moreover a model which allows for examining a lengthy period of time appears to be extremely useful for tracing the development of ideas and institutions. Like all analytical models, however, shortcomings inevitably appear. Models

of analysis are merely representations of how we believe complex phenomena actually operate. The following sections review a handful of areas where improvements could be made in the model.

The Role of Policy Entrepreneurs

The literature identifies policy entrepreneurs as important factors in policy change, but the punctuated equilibrium model appears to downplay their role. This is not to say that the model discounts the role of policy entrepreneurs, but Baumgartner and Jones contend that the causes of change are “more complex than the behaviors of any single actor” (Baumgartner and Jones 1993, 242). Undoubtedly this is a truism. Given the longitudinal perspective of the punctuated equilibrium model, coupled with the complexity of the origins of policy change dynamics, individual political actors can possibly play an important, but not necessarily decisive role. Nevertheless, studies of policy change often uncover the actions of individuals who contribute to policy change in important ways. As Kingdon (1984) notes, policy entrepreneurs who can effectively attach solutions to problems, and do so at propitious times, can play a vital role in shaping agendas and affecting policy outcomes.

One individual who stands out in this study is Energy Secretary James Watkins who brought about change from within the policy monopoly at a time when the conditions were ripe for change. More than any other individual identified during the research conducted for this study, Watkins played a key policy entrepreneur role. Watkins did not necessarily craft entirely new ideas, but because of his position in the policy monopoly, his ideas, such as the creation of the Office of Environmental Management and the “Tiger Team” concept, could

be implemented. Because of his activism, Watkins effectively managed the process of change by retaining the initiative in the fast moving situation (Hubbard interview, 2000).

Other individuals, specific members of Congress and grassroots organizers, were also important for policy change. Senator John Glenn, as chairman of the Government Operations Committee was in a key position to influence policy by focusing attention on ES&H problems and spearheaded the effort to create the Defense Nuclear Facilities Safety Board. Similarly, Representatives Ron Wyden and David Skaggs were active in introducing legislation in Congress designed to advance solutions to policy problems. These efforts bore little fruit initially, but became more popular as the ES&H crisis at the production complex deepened after Chernobyl. These entrepreneurs essentially crafted the foundation of policy change by connecting solutions to problems (i.e., articulating new policy structures) which were later used for new pieces of legislation.

At another level, Lisa Crawford, co-founder of Fernald Residents for Environment Safety and Health, and Frances Hart, director of the Energy Research Foundation at Savannah River, played entrepreneurial roles in the effort to bring about changes at the facilities near their communities. Although these efforts were local in nature they received national recognition. While grassroots organizers were not members of key political venues, their main contribution, it seems, was to shape local policy images by calling attention to the ES&H problems in the weapons production complex and essentially redefine prevailing policy images. Moreover, some grassroots organizers were active in taking the policy conflict into the courts where a handful of victories were achieved.

In short, actions by political entrepreneurs can be critical for policy change and the punctuated equilibrium model could be improved by posing hypotheses to include such individuals and their actions. Future use of the punctuated equilibrium model could better incorporate the role of policy entrepreneurs by hypothesizing about the relationships between entrepreneurial activity and endogenous change, and individual actions and image changes at the local level.

The Impact of a Focusing Event for Policy Change

In their explanation of the punctuated equilibrium model, Baumgartner and Jones (1993) appear to downplay the role of a focusing event on policy change. Studies of the demise of nuclear power seem to support this approach; nuclear power policy was already in a serious decline before the accident at Three Mile Island. Yet nuclear weapons production policy change was clearly affected by the Chernobyl accident in 1986. While it is true that the Chernobyl accident itself did not change nuclear weapons production policy, it initiated a dynamic process that brought about major changes. The accident raised the attention level of Congress and, perhaps most importantly, stimulated an analytical process whereby expert opinion about the state of nuclear weapons production policy was assembled. The expert advice was devastating to the policy image and appeared to confirm the definition of the problem as articulated by policy reformers. Although a limited degree of policy change was already underway, the Chernobyl accident appeared to accelerate the process of policy change by virtue of the fact that it stimulated a level of awareness that had been limited prior to April 1986.

Birkland (1997) provides the most useful springboard for understanding the importance of such focusing events as the Chernobyl accident by distinguishing between

the immediate post event period and a longer interval of time defined by the political response to a focusing event. Perhaps the most important dynamic of the immediate period following the accident was that the established policy reform community, including key members of Congress, were able to seize upon the accident to both exploit the weakening policy images and press the case for policy change. In terms of the longer interval of time that represented the political response to the Chernobyl accident, the most obvious factor impacting nuclear weapons production policy change were the findings of the Roddis and NAS panels. The findings were devastating to the policy image and suggested important institutional changes that were manifest in several key pieces of legislation. While the attention generated by the Chernobyl accident were clearly important, it seems that the most important impact occurred in the aftermath of the disaster when analytical attention was focused on nuclear weapons production policy.

Learning and Policy Change

Although the analysis of this paper did not focus on the role of learning in nuclear weapons production policy change, a learning process was clearly at work and probably had some effect. What was being learned was the danger associated with radiation exposure. When the nuclear weapons production policy monopoly was created there was an assumption of a threshold dose of radiation, below which no harm was done. While this view was not unanimous, it was generally accepted and became the basis of safety standards. As time went on, however, and as more research was conducted, some amount of scientific opinion changed to the perception that even low doses of radiation could cause physical harm. Yet even the learning process, which was fairly well developed by the late 1970s and early 1980s, was not enough to alter institutional structures. Despite

calls for shifting radiation health authority away from the Department of Energy, this was not accomplished until 1990. In other words, despite the learning process, which undoubtedly was at work, the institutional structure did not easily yield to change based on learning and the accumulation of knowledge.

Perhaps a means of improving the punctuated equilibrium model would be to incorporate the concept of learning as it affects policy image. It would be fair to argue that the learning process played a role in negatively affecting nuclear weapons production policy's image. In addition, learning processes raised questions about the wisdom of an institutional structure. Nevertheless, as Weart (1988) has shown, public perceptions of radiation exposure were not necessarily tied to the expansion or accumulation of scientific knowledge. Even as the debate over radiation health persisted, and definitive conclusions about links between radiation exposure and cancer rates remained somewhat murky, the negative image had crystallized. Although public opinion was probably not shaped by learning, it is more likely that learning was a factor in the development of negative images within certain institutional venues. If so, it would be useful to incorporate hypotheses which explore the emergence and actions of coalitions endogenous or exogenous to a policy monopoly which utilized learning as the basis for ideas and the expansion of policy conflict (Sabatier and Jenkins-Smith 1993).

Local-Level Images and their Relationship With National-Level Images

One of the contentions of this study was that policy image change at the local level led to images changes at the national level (see hypothesis nine above). The findings of this study illustrate that local-level policy image indeed changed prior to those at the national level, measured by a content analysis of national and local media sources.

The contention that local change led to national change is a bit more tenuous. While the timing of image change can be fairly well established, the mechanism whereby local leads to national needs further exploration. In other words, what processes or dynamics affect the interrelationship between local and national-level policy images?

This study identified congressional representatives as a mechanism that played a role in local-nation image change. Representatives and Senators whose districts and states hosted weapons production facilities were involved to some degree with the local controversy and “took the story” to Congress, held hearings and proposed legislation. It is also possible that until 1986-89 the ES&H problems at the weapons complex appeared to be isolated events rather than evidence of a systemic problem. Once the connection had been made, media coverage expanded dramatically and took on a decidedly negative tone. A closer examination of the media might reveal the process where national sources begin following local news stories. Finally, the activity of national and grassroots groups served as a vehicle for moving local images to the national level by creating media events such as demonstrations and releasing studies indicting weapons plant operations.

Epilogue

Taking a long view of nuclear weapons production policy we find remarkable stability for nearly 40 years. Both the institutional structure and the supporting policy images were extremely powerful in an era when opposition was scattered and silent. Yet the resiliency of the policy monopoly broke down as images of the policy changed in the wake of accidents, mishaps and a decline of government credibility.

In general, the findings in this study indicate change in nuclear weapons production policy occurred incrementally from 1970-1985, and expanded dramatically

from 1986-1994. By 1994, the policy was transformed almost entirely from one focused on weapons production, to one focused on environmental cleanup and compliance.

Production of nuclear materials and weapons is a shadow of its former self. The vast majority of the DOE effort is now focused on cleaning up the legacy of the Cold War, a task that is projected to cost billions of dollars over several decades.

The complex factors leading to policy change came from a variety of sources both endogenous and exogenous to the nuclear weapons production policy monopoly. A handful of key ideas, centering on environmental compliance, reached political agendas where new institutional structures and arrangements altered the formerly closed policy monopoly. Moreover, the dramatic rise of negative images, spurred by both events and the efforts of policy reform proponents, created an atmosphere within which policy change occurred.

The story of how environmental, safety and health policy permeated the previously closed nuclear weapons production policy monopoly after nearly 40 years raises important theoretical questions about policy change and the dynamics which stimulated such dramatic and sudden change after years of stability. Explaining policy change is important not only for understanding the evolution of a particular policy, but also for understanding how and why the American policy process itself has undergone change. In other words, explaining policy change is as much a story of a specific policy as it is an illustration of the changes in the larger American public policy processes.

The results of this study appear to confirm the utility of the punctuated equilibrium model with its emphasis on the interaction between policy venue and policy image. Change in nuclear weapons production policy resulted from a complex interplay

of new ideas and institutional structures, the expansion of conflict and the mobilization of opposition, and changes in images of specific policy as well as the federal government more generally. It is a compelling story, and one that reflects widespread changes in American politics and society.

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LIST OF ABBREVIATIONS

ACHRE	Advisory Committee on Human Radiation Experiments
AEC	Atomic Energy Commission
ATLC	Atomic Trades and Labor Council
CAB	Citizens Advisory Board
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EPI	Environmental Policy Institute
ERDA	Energy Research and Development Administration
ES&H	Environmental, safety and health
FFCA	Federal Facilities Compliance Act
FOIA	Freedom of Information Act
GAC	General Advisory Committee
GAO	General Accounting Office
IAG	Interagency Agreement
JCAE	Joint Committee on Atomic Energy
MLC	Military Liaison Committee
NPL	National Priorities List
NRC	National Research Council
NRDC	Natural Resources Defense Council
OCATW	Oil, Chemical & Atomic Worker's Union
OTA	Office of Technology Assessment
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reorganization Act
UCS	Union of Concerned Scientists