

State-Corporate Crime and the Paducah Gaseous Diffusion Plant

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Abstract: *While criminologists have for some time examined state and corporate crime as separate entities, the concept of state-corporate crime highlighting joint government and private corporate action causing criminal harm is a recent area of study with relatively few published case studies (Matthews and Kauzlarich, 2000). This paper focuses on state-corporate crime at the Paducah Gaseous Diffusion Plant (PGDP) in Paducah, Kentucky, and contributes to the study of state-corporate crime in three ways: (1) it adds a new case study to a field in which there are few published accounts, (2) it assesses the utility of Kauzlarich and Kramer's (1998) integrated theoretical framework of state-corporate crime by applying it to understanding harms at PGDP, and (3) it demonstrates how the state role in state-corporate crime can evolve from that of instigator to facilitator. PGDP is an especially important case study in the field of state-corporate crime because it constitutes a rare instance in which the federal government has both acknowledged and apologized for its role in harms caused to plant workers and the environment.*

Keywords: State-corporate crime; Paducah Gaseous Diffusion Plant

Introduction

Nuclear workers' compensation is a national debt long due to our Cold War veterans who've paid the highest price possible for their service.

— Energy Secretary Bill Richardson
(Carroll, 2000b)

A *USA Today* series, "Poisoned Workers and Poisoned Places" (Eisler, 2000), brought public attention to the ever-growing evidence of government and corporate misconduct in the nuclear industry. The series described how the U.S. government hired companies to process nuclear materials, and estimated that about 550 plants may have conducted work related to the government's nuclear program. The series further described how health and environmental problems at these facilities were kept secret by government officials and company executives (Eisler, 2000). This paper examines activities and their resulting harms at one nuclear facility, the Paducah Gaseous Diffusion Plant (PGDP), near Paducah, Kentucky. Our examination of the activities and harms at PGDP that led to Energy Secretary Richardson's apology to plant employees on behalf of the federal government leads us to classify the harms at PGDP as state-corporate crime. PGDP activities demonstrate the harm potential from state-corporate crime and necessity of continued study in this area; at a time when federal government is

considering renewed and increased reliance on nuclear power (e.g., Baker and Mufson, 2006), examination of harms stemming from the nuclear industry is of particular importance. This paper contributes to the study of state-corporate crime in three ways: (1) it adds a new case study to a field in which there are few published accounts, (2) it assesses the utility of Kauzlarich and Kramer's (1998) integrated theoretical framework of state-corporate crime through application to understanding harms at PGDP, and (3) it demonstrates how the state role in state-corporate crime can change over time from that of instigator to facilitator.

Traditional Criminological Research and State-Corporate Crime

Historically, criminological research has focused on law violations by individuals, neglecting state activities performed in pursuit of apparently legitimate goals. Official sources of crime data reinforce this traditional criminological focus by emphasizing individual acts and one-on-one harms (Reiman, 2001). Recently, however, state-corporate crime has emerged as an area of research recognizing the need to extend traditional criminological focus beyond the individual's violation of law (Kramer, 1992; Kauzlarich and Kramer, 1993; Kauzlarich and Kramer, 1998; Matthews and Kauzlarich, 2000).

The importance of state-corporate crime as a research

focus is highlighted by damage described in the few studies of state-corporate crime published to date (Kramer, 1992; Aulette and Michalowski, 1993; Kauzlarich and Kramer, 1993; Matthews and Kauzlarich, 2000); moreover, the extent of harm from state-corporate crime likely extends beyond injury and financial cost to a general loss of confidence in government. Examination of state-corporate crime also reveals a general lack of preparation for dealing with disaster; although technology has developed at breakneck speed, a parallel development of safety and rescue technology has not occurred. History is replete with examples, all too often ignored, of what happens when technology goes awry (Perrow, 1984).

The complexity of state-corporate crime arises from the nature of the offenses; unlike traditional “street crime,” state-corporate crime is not characterized by the intent of a single actor to violate law for personal pleasure or gain. Criminal actions by the state often lack an obvious victim, and diffusion of responsibility arising from corporate structure and involvement of multiple actors makes the task of attributing criminal responsibility difficult (Stone, 1978; Clinard and Yeager, 1980; Becker, Jipson, and Bruce, 2000). Furthermore, sufficient understanding of state-corporate crime cannot be gained through studying individual actors; one must also consider broader organizational and societal factors. The integrated theoretical framework proposed by Kauzlarich and Kramer (1998), proposes analysis of events at institutional, organizational, and interactional levels and, we believe, is especially useful for analysis of state-corporate crime.

State-Corporate Crime Defined

Kramer, Michalowski, and Kauzlarich (2002) describe the origins, development and status of state-corporate crime theory. Kramer et al. note that the study of state-corporate crime emerged from earlier research on white-collar and organizational offending. In his study of the 1986 space shuttle Challenger disaster, Kramer (1992) found the disaster could best be explained by considering the interaction between the state and a corporation, specifically “(t)he National Aeronautics and Space Administration (NASA), a governmental agency, and Morton Thiokol, Inc., a private business corporation” (Kramer et al., 2002:268). Kramer recognized existing research had failed to examine the longstanding relationships between corporations and government that result in public harm. While criminologists had studied crime by government and crime by private corporations these were effectively two separate research camps; Kramer’s Challenger shuttle disaster research brought the two

camp together, revealing how a state-corporate relationship can result in criminal harm. Subsequent research revealed differences in the relationship between government and corporation in state-corporate crime. For example, while Kramer (1992) demonstrated how the state can actively initiate a state-corporate relationship resulting in crime, Aulette and Michalowski’s (1993) study of a fire at Imperial Food Products in Hamlet, NC, that caused 25 deaths and multiple injuries revealed a more passive governmental role in which failure to enforce regulations allowed a corporation to continue the deliberate violation of safety standards. Recognition of differences in the state-corporate relationship has led to recognition of two distinct forms of state-corporate crime—state-initiated and state-facilitated:

State-initiated corporate crime (such as the Challenger explosion) occurs when corporations, employed by the government, engage in organizational deviance at the direction of, or with the tacit approval of, the government. State-facilitated state-corporate crime (such as the Imperial Food Products fire in Hamlet) occurs when government regulatory institutions fail to restrain deviant activities either because of direct collusion between business and government or because they adhere to shared goals whose attainment would be hampered by aggressive regulation. (Kramer et al., 2002:271-272)

While this distinction between state-initiated and state-facilitated corporate crime is important, our examination of events at PGDP contributes to the study of state-corporate crime by demonstrating how evolving state behavior can transform the role of the state from that of instigator to facilitator of state-corporate crime; it is apparent that the state both initiated and subsequently facilitated illegal activities at PGDP through collusion with PGDP administrators to conceal harms to workers and prevent enforcement of safety regulations.

An important issue for conducting research on state-corporate crime is whether organizations can be legitimately regarded as offenders or whether they are merely collections of individuals who ultimately exercise control over their own actions. The history of criminology is dominated by a focus on the individual as offender with theory directed at explaining individual criminality (Clinard and Yeager, 1980). Yet as we describe below, there has long been recognition that corporations operate as distinct entities and can legitimately be classified as offenders; this position is becoming more widely recog-

nized by criminologists (Kauzlarich, 1995).

Legally, corporations were first identified as actors punishable by criminal law in 1909 (Geis, 2005) when the U.S. Supreme Court reasoned in *New York Central & Hudson River Railroad Company v United States* that:

(t)here is a large class of offenses...wherein the crime consists in purposely doing the things prohibited by statute. In that class of crimes we see no good reason why corporations may not be held responsible for and charged with the knowledge and purposes of their agents, acting within the authority conferred upon them... to give them immunity from all punishment because of the old and exploded doctrine that a corporation cannot commit a crime would virtually take away the only means of effectually controlling the subject-matter and correcting the abuses aimed at [sic]. <<http://caselaw.lp.findlaw.com/cgi-bin/getcase.pl?court=US&vol=212&invol=481>>

Sociologists have long recognized that industrialization produced bureaucratic organizations comprising positions that shape employee behavior by requiring specific actions (e.g., Weber, 1947; Nelson, 1975; Hall, 1987), and that corporate action has significant impacts upon society (e.g., Johnson and Douglas, 1978; Vaughan, 1983; Hall, 1987). A number of researchers argue that organizations should be regarded as actors in their own right. Kramer et al. (2002) identify three reasons why organizations should be seen as “real social actors.” First, organizations persist over time; specific positions within organizations persist and are filled by different people required to perform the same tasks, thus the general behavior of the organization persists. Second, accepted organizational procedures and norms for conduct shape individual behavior. Finally, organizational goals take precedence over those of individual workers. Coleman (2002:103) elaborates upon the precedence of organizational goals over those of individual workers by describing “the irrelevance of persons.” He notes that organizations comprise positions, rather than unique individuals, and that what is needed is someone or something to fill a particular position. Thus, if one person leaves an organization, cannot or will not perform required tasks, they are easily replaced by someone who can and will perform the tasks required by the overriding organizational goals. Taken to its logical conclusion, Coleman (2002) argues that as technology allows, an organizational position can just as adequately be filled by a machine capable of the required tasks as a person. Furthermore, corporate goals,

hierarchical structure that dilutes individual responsibility and helps conceal wrongdoing, and the characteristics of the arena in which a corporation operates all contribute to corporate criminality regardless of individual employees (Clinard and Yeager, 1980). Finally, as noted by Coleman (1985:14) corporations can generate a tradition of criminal practices in pursuit of legitimate corporate goals, and while:

(i)ndividual actors must still carry out the criminal deeds, there is ample evidence to show that the attitudes and characteristics of the individual offenders are often of little importance. Those who refuse to carry out the illegal activities demanded by their organization are simply replaced by others who will.

We believe, then, that the behavior of organizations amounts to more than the collective actions of autonomous individuals and that organizations are a legitimate focus of criminological inquiry.

Methods

The current research uses the case study approach (Berg, 2001), which has previously been used to examine state-corporate crime (Kramer, 1992; Aulette and Michalowski, 1993; Kauzlarich and Kramer, 1993; Matthews and Kauzlarich, 2000). Specifically, we use what Stake (2000:437) calls an instrumental case study where “a particular case is examined mainly to provide insight into an issue or to redraw a generalization. The case is of secondary interest; it plays a supportive role, and it facilitates our understanding of something else.” Thus, while description of events at PGDP is important and interesting, our goals include using this case to determine the usefulness of Kauzlarich and Kramer’s (1998)¹ integrated theoretical framework for explaining state-corporate crime and to enhance understanding of this offense type.

The nature of available data is of primary concern in qualitative research (Platt, 1981; Yin, 1994) and, as explained below, recent events have reduced access to official documents on PGDP. Our data sources include government reports and media archives. Two newspaper archives indexing articles about PGDP were especially useful: *The Washington Post* archive, and *The (Louisville) Courier-Journal* archive. We have used primary data whenever possible; however, problems in accessing certain information called for alternative data sources. Since the attacks of September 11, 2001, the

Department of Energy (DOE) has removed some reports from its website until they are deemed appropriate for public consumption. While we obtained much data prior to this security measure, in some instances we have had to rely on secondary sources, such as media coverage, for additional information. In other instances, we have used secondary reports when the news media asked impartial experts to evaluate technical data contained in DOE reports and releases. It is important for the reader to understand why we relied in part on newspapers, rather than original sources, for some data; we are concerned with understanding the state-corporate relationship leading to harms at PGDP and following accepted practice in case study research (see Platt, 1981; Yin, 1994) have examined the most influential and informative documents.

History of the Paducah Gaseous Diffusion Plant

The United States began enriching uranium in the early 1940s to produce fissionable material for the atomic bomb (USEC, 2001). The Atomic Energy Commission (AEC) eventually took control of the enrichment program, and the first plant began operation in 1945 (USEC, 2001). In October 1950, the U.S. government announced that a new plant to produce enriched uranium for both nuclear power production and nuclear weapons would be located near Paducah, Kentucky (Office of Oversight, Environment, Safety and Health, 2000). The decision to locate the plant near Paducah was popular among residents, as the area was experiencing a long period of economic hardship. The community welcomed the plant and the resulting economic prosperity brought new residents. The economic benefits were so far-reaching that “even the city’s brothel added a wing,” and Paducah became known locally as “Boomtown” (Malone, 2000a). The U.S. government’s decision to take advantage of economic need to foster community support for controversial and dangerous activities is not without precedent (Bullard, 1993; Bullard, 2000; Pellow, 2002).

Throughout its history PGDP has experienced changes in contractors, operators and regulators. When PGDP began producing enriched uranium in 1952, the DOE contracted the Union Carbide Chemical Company to operate the plant (Office of Oversight, Environment, Safety and Health, 2000). In 1984, the Martin Marietta Corporation replaced Union Carbide as the plant contractor (USEC, 2001). In 1993, the United States Enrichment Corporation (USEC) leased the production facilities from the DOE and managed the plant. USEC retained Martin Marietta, now the Lockheed Martin Corporation, as the plant contractor (USEC 2001). In 1997 USEC became

a private corporation, and the following year it assumed control of enrichment activities (Bechtel Jacobs Company, 2001).

There have also been changes in the regulatory agencies that had responsibility over activities at PGDP. In January 1975, functions previously under the control of the AEC were transferred to two different agencies: the Energy Research and Development Agency (ERDA) assumed responsibility for uranium enrichment, while the Nuclear Regulatory Commission (NRC) assumed responsibility for the “regulatory oversight of nuclear power plants” (USEC, 2001). In 1997, the DOE assumed control of ERDA responsibilities (USEC, 2001).

The following descriptions help put into perspective the quantities of radioactive material processed at PGDP:

(e)nough radioactive scrap metal to build a full-size replica of the battleship Missouri; enough low-level radioactive waste to cover more than 22 football fields a yard deep; enough polluted ground water to fill 680,000 residential swimming pools. If laid end to end, the more than 37,000 cylinders of spent uranium being stored outdoors would span 70 miles. (Carroll and Malone, 2000a)

In June 1999, a whistleblower, or *qui tam*, suit was filed against Lockheed Martin by three workers at PGDP and the Natural Resources Defense Council, an environmental group, under the *False Claims Act* (Warrick, 1999b). The suit alleged that Lockheed Martin falsified environmental safety reports and caused massive environmental damage by mishandling radioactive and chemical materials (Bartleman, 2003). The *False Claims Act* allows private citizens to file *qui tam* lawsuits. In a *qui tam* suit, whistleblowers collect a percentage of money resulting from the lawsuit, while being protected against retaliation stemming from the suit (Kohn, 2001). After a *qui tam* suit is filed, the U.S. government may join the plaintiffs and use its resources to pursue the case. In May 2003, the Justice Department reported that it would join the lawsuit only for the allegations that hazardous wastes were mishandled (Malone and Carroll, 2003).

Based on information from this lawsuit, *The Washington Post* broke the story that workers at PGDP had been “exposed to dangerous fission byproducts without their knowledge” (Warrick, 1999a). In the following years allegations and evidence of harm to workers, the community, and the environment has continued to mount.

PGDP Harms

To fully demonstrate the harm arising from activities at PGDP we present separately the harm to workers, and harm to the public and environment.

Harm to Workers

In the 1950s and 1960s, workers and management at PGDP did not *fully* understand the hazards of working with radiation and certain chemicals (Office of Oversight, Environment, Safety and Health, 2000). From early in the plant's history, management gave the impression that employee exposure to dangerous radioactive materials was minimal. This attitude is clearly reflected in managerial decisions that put employees in considerable danger. For example, Paducah managers encouraged workers to wear personal clothing rather than plant-issued protective clothing even though it was thought workers were being exposed to dangerous materials (Office of Oversight, Environment, Safety and Health, 2000). Furthermore, carelessness and a lack of knowledge led to contamination throughout the facility, including the plant's lunch room and theater (Office of Oversight, Environment, Safety and Health, 2000). Workers were generally happy in the belief that their efforts were protecting the country, and in the 1950s some workers even took part in government radiation experiments that involved breathing radioactive gas and drinking uranium (Office of Oversight, Environment, Safety and Health, 2000).

As early as 1953, concern was expressed about visible radioactive dust at PGDP, and in 1959 Union Carbide, which then operated the plant, requested studies by the AEC on the potential for health risks (Office of Oversight, Environment, Safety and Health, 2000). Several times in the plant's history, recommendations that workers be tested for potentially harmful exposures were ignored. For example, a 1960 memo revealed that even though it was recommended that 300 PGDP workers be tested for exposure to neptunium, management declined to do so out of fear the union would then request hazard pay (Office of Oversight, Environment, Safety and Health, 2000). Also, in 1985 a government task force recommended a study be done to determine whether plant workers were being exposed to uranium ash contaminated with high levels of plutonium (Malone, 1999); once again, the study was never conducted.

Because workers were exposed to radioactive and other harmful materials, there would be a natural concern about long-term health problems. A comparison of the incidence of cancer around PGDP with national rates

reveals ten leukemia deaths when only one was projected (Warrick, 1999d). Canadian researchers exhumed a former employee's body in 1983 and tested the bones for uranium. Although the results were not published at the time, *The Washington Post* reported in 1999 that the tests indicated uranium levels up to 133 times higher than normal (Warrick, 1999c). A 2001 DOE report acknowledges that "(a)s many as 400 Paducah Gaseous Diffusion Plant workers received an annual radiation dose up to 20 times the limit now considered safe" (Malone, 2001). In addition:

(u)p to 4,000 workers performed duties between 1952 and 1985 in plant areas where they could have received high radiation exposure. One in 10 received doses "that approached or exceeded" regulatory limits ... and many more workers went untested because managers did not think it necessary. (Carroll, 2000d)

The potential for harm to employees has continued and there appears to be inadequate supervision to prevent employees violating safety guidelines. Between 1994 and 1999, Nuclear Regulatory Commission inspectors found several problems including workers pounding on a uranium-plugged process line with a hammer, smuggling beer into the plant, sleeping during the handling of liquid uranium hexafluoride, and performing jobs without being properly trained (Carroll, 1999a).

Harm to the Public and Environment

Reports indicate the public was not properly informed about potential hazards associated with PGDP (Office of Oversight, Environment, Safety and Health, 1999; Office of Oversight, Environment, Safety and Health, 2000). For example, liquid waste that included uranium and fission products was released "into ditches, ponds, and streams, with subsequent flow into the Big and Little Bayou creeks, ultimately reaching the Ohio river" (Office of Oversight, Environment, Safety and Health, 2000:20). Although plant officials were aware of such problems, they did not always act on such information, as illustrated by a 1977 internal plant memo that acknowledged uranium discharges were being "significantly underestimated" (Office of Oversight, Environment, Safety and Health, 2000). Because of such acts, wells around the plant became contaminated, leading the government to provide free municipal water to some residents and businesses (Office of Oversight, Environment, Safety and Health, 1999). Contaminated materials also were improperly

removed from PGDP property. The Office of Oversight report (Office of Oversight, Environment, Safety and Health, 2000) found that material released to the public—for example, old equipment that was sold—was not always properly screened for contamination. In addition, waste materials, such as scrap wood and metals, were not adequately controlled as members of the public would salvage these from PGDP property.

Evidence of potential harm to the community and environment has continued to emerge. In 1999, one lawsuit plaintiff described recent problems at the plant: a computer from the plant that was supposed to be donated to a school was discovered to be contaminated by radiation; some members of a work team on a radioactive site failed their training because, it turned out, they were functionally illiterate and could not read posted hazard signs; cleanup teams were sent into a contaminated building without protective breathing equipment; and no monitoring devices existed in places like cafeterias to ensure that workers who may have been exposed to radiation do not bring contamination with them (Carroll, 1999b).

Another recent problem included the 1999 discovery of “radioactive black ooze” seeping from ground near PGDP (Office of Oversight, Environment, Safety and Health, 1999). A year later, beryllium, a suspected carcinogen, was discovered in soil, surface water, and ground water samples beneath the plant; one soil sample had 155 times the natural level (Malone, 2000b). More effects of practices at PGDP were revealed in a study that found “(m)ore than half of 44 raccoons examined had above-normal radiation emissions...The findings are significant because raccoons eat almost anything, so if there is contamination low in the food chain, it would show up in them” (Carroll, 2000e). DOE maps released in 2000 showed that:

11 contaminants have spread extensively into the recreation and wildlife areas surrounding the plant...Amounts of highly radioactive neptunium were 509 times as high as what is normally found in the environment, and radioactive cesium was found at levels up to 326 times normal. (Malone, 2000d)

Even with reports such as these, the true extent of problems at PGDP will never be known. It is estimated that 27.4 percent of records about safety concerns were destroyed before USEC took control of the plant in 1993 (Carroll and Malone, 2000b). These records are thought to have included evidence of a lax attitude toward safety by first-line supervisors, inconsistent investigations of

accidents, purposeful violations of health and safety rules by management and rank-and-file workers, and use of old data and questionable analyses to assess environmental contamination (Carroll and Malone, 2000b). This evidence suggests steps were taken to conceal evidence relating to plant safety; the DOE has concluded that the destruction of these computer and paper records was “inappropriate” (Carroll and Malone, 2000b).

Despite the evident harms and rule violations, between the mid-1980s and 2000, the state of Kentucky fined the DOE only \$5,000. “Kentucky officials say they (were) hampered over the years by government secrecy, a lack of resources and, until 1992, questions about whether they could legally challenge the Energy Department” (Malone and Carroll, 2000). Government secrecy about nuclear activity is nothing new, and the present findings are consistent with previous discoveries (Kauzlarich and Kramer, 1998).

An Apology, Compensation, and Clean-Up

In 1980, after PGDP employee Joe Harding died of cancer, the U.S. government refused to pay his wife survivor benefits, claiming his illness was not related to radiation exposure, and spent \$1.5 million fighting the claim (Shipley, 2001). Harding’s wife eventually settled for \$12,000 (Warrick, 1999c), but continued to fight the case along with others who alleged harm. These efforts contributed to passage of the \$1.9 billion *Energy Employees Occupational Illness Compensation Act*, which provides medical and financial help for workers and their families at a number of nuclear facilities where dangerous work was conducted. The compensation plan has a limit of \$150,000 per claim and does not cover lost wages due to “illness or injury from exposure to radiation and hazardous chemicals” (Carroll, 2000b).

On May 31, 1994, the Paducah Gaseous Diffusion Plant was identified for priority cleanup and added to the Environmental Protection Agency’s Superfund national priorities list. The DOE has established a clean-up schedule to be completed by 2010. More than \$1.3 billion has been allocated to deal with pollution in groundwater, surface water, surface soils, burial grounds, waste barrels, and unused process buildings, and to monitor the site and issue clean-up reports (Jones, 2000).

On Sept. 16, 1999, the federal government took the unusual step of issuing a formal apology for concealing information that caused PGDP workers to be placed in danger. Then-Energy Secretary Bill Richardson visited Paducah and at a community meeting stated:

On behalf of the U.S. government, I am here to say I am sorry ... We are apologizing to the workers in Paducah. From the evidence that has been uncovered recently, it's obvious that the U.S. government was not forthcoming about possible exposure to plutonium, and that was wrong. We should have been straight with our employees. (Malone and Carroll, 1999)

While the DOE has estimated it will cost \$1.3 billion to clean up PGDP (Jones, 2000), other estimates suggest the cost will be as high as \$5 billion (Malone, 2000c). There is also concern that even if the cleanup is completed by the 2010 deadline that will not mean the plant is "clean" in the way most people understand the term. Court action continues between federal and state authorities over what "clean" actually means (Carroll, 2000a). While cleanup operations are now underway there is concern that they may not be properly conducted; regulators have already cited the DOE for violating state-air quality regulations while clearing "Drum Mountain" (Gil, 2000). Drum Mountain is a 40 foot tall pile of discarded radioactive metal drums (Malone, 2000c).

Integrated Theoretical Framework

To fully understand state-corporate crime, Kauzlarich and Kramer (1998) propose an integrated theoretical framework that considers the impact of specific "catalysts for action" at three levels of analysis. Traditional criminological theories typically focus on relations between individual actors and exclude consideration of organizational or social structural factors on behavior. While Kauzlarich and Kramer (1998) recognize the importance of the *interactional level of analysis* (face-to-face interaction, individual action) they also recognize this is insufficient for more fully understanding organizational behavior. It would be easy to blame the actions of individual employees for the harms at PGDP but such an approach is insufficient for understanding these harms as it overlooks the vital role of organizational and institutional factors. Organizational structure, goals, and culture are important determinants of both organizational and individual behavior; thus, an *organizational level of analysis* (structure and process) is also necessary to understand state-corporate crime. Finally, both organizational and individual behaviors are influenced by the broader social context, so an *institutional level of analysis* (historical, political, economical, and cultural factors) is necessary to complete the analysis of state-corporate crime. At each level of analysis, Kauzlarich and Kramer (1998) identify

the interaction of three "catalysts for action": motivation, opportunity structure, and social control. Kauzlarich and Kramer's (1998) integrated model helps illustrate how institutional, organizational, and individual actors contributed to the events at PGDP.

Institutional Level of Analysis

Motivation. At the institutional level of analysis, the Cold War climate encouraged use and development of nuclear technology, created public support for the nuclear industry, and created a sense of urgency in the development of nuclear technology. In such an atmosphere, the perceived greater national good was given precedence over health hazards to employees or environmental damage. The perceived threat of nuclear weapons in the Soviet Union meant that organizational goals were to be quickly achieved, even at the expense of individuals and the environment. This likely contributed to acceptance of some "rule bending" in pursuit of apparently legitimate goals. A 2000 DOE report points out that during the Cold War, health, safety, and environmental concerns were less important than the pressing demands of the Cold War (Office of Oversight, Environment, Safety and Health, 2000).

A number of governmental goals provided the motivation for rapid development of the nuclear industry, and these goals could not have been achieved without the involvement of private corporations. Duffy (1997) describes the following governmental goals that motivated the rapid development of nuclear technology and the involvement of private corporations: energy needs, controlling nuclear proliferation, deterring the Soviets, and remaining the leader in nuclear development.

Opportunity structure. Although the government drove development of the nuclear industry, it would not have flourished without the involvement of private corporations. The opportunity for private corporate involvement was created by passage of the *Atomic Energy Act* of 1954. Previously the *Atomic Energy Act* of 1946 had "expressly forbidden private ownership of nuclear materials and had established an absolute government monopoly over nuclear energy" (Ford, 1982:41). The 1954 act reveals changing attitudes toward nuclear energy, as it allowed "private companies to build and operate commercial nuclear-power stations" (Ford, 1982:41). Private corporations had been reluctant to call for changes in legislation to allow their involvement in the nuclear industry because of its financial uncertainties; the cost of establishing nuclear production facilities, combined with its potential for risk, scared corporations away from this

technology. The federal government encouraged private corporations to get involved and offered them economic incentives to do so. Duffy (1997:34) states:

The “solution” to the government’s “problems” was the *Atomic Energy Act* of 1954 which, in effect, created both commercial nuclear power and a commercial nuclear power industry. In this sense, the development of commercial nuclear power is unusual in that it emerged from an effort initiated by government rather than by private industry.

This is an important point for our argument that harms at PGDP are initially an example of state-initiated state-corporate crime; from the beginning it was the federal government that initiated involvement of private corporations in the development of this field.

Government efforts to promote a peaceful image of nuclear power contributed to the opportunity to develop nuclear technology. These efforts included downplaying the danger of nuclear technology and the need for safety precautions, while emphasizing its advantages. In a 1953 address to the United Nations General Assembly, President Eisenhower presented his vision of “atoms for peace.” “The United States knows that peaceful power from atomic energy is no dream of the future. That capability, already proved, is here-now, today,” Eisenhower said. He went on to say that nuclear energy could be used to “provide abundant electrical energy in the power-starved areas of the world” (Ford, 1982:40). In 1954, construction of the nation’s first commercial nuclear power plant was presented to the public in dramatic fashion when Eisenhower appeared on television and, with a wave of his hand, “signaled an unmanned, radio-controlled bulldozer to begin breaking ground” for the plant (Stoler, 1985:16).

The events at PGDP can be classified as state-initiated state-corporate crime; they could not have occurred without government efforts. Government created the opportunity for development of the nuclear industry by initiating the involvement of private corporations, and waging a campaign that emphasized the nuclear threat to the United States while changing perceptions of nuclear technology as purely destructive.

Social control. At the institutional level, there has historically been little social control over the nuclear industry (Kauzlarich and Kramer, 1998). Secrecy has dominated the industry, and government’s ability to single out and replace people who violate its rules has helped divert criticism. Nuclear technology was developed in

an atmosphere of irresponsibility that minimized safety concerns. According to former AEC attorney Harold Green “nobody really ever thought safety was a problem. They assumed that if you just wrote the requirement that it be done properly, it would be done properly” (Ford, 1982:42). This laissez-faire approach to safety enforcement contributed to the absence of social control throughout the nuclear industry.

The comments of Edward Teller, head of the AEC’s Reactor Safeguards Committee, illustrate how advancing nuclear development was considered more important than safety concerns. In a 1953 discussion on whether to continue the practice of creating “exclusion distances” around nuclear reactors to keep the public at safe distance, Teller warned that enforcement of safety regulations “must not stand in the way of rapid development of nuclear power” (Ford, 1982:43). These comments reveal that despite awareness of dangers involved in developing nuclear technology, government was prepared to loosen its control over the nuclear industry to achieve its goals. A lax attitude at the institutional level creates an overall climate that reduces the likelihood rigorous control efforts will be a priority in the nuclear industry.

In the case of PGDP, social control was inadequate at the institutional level as regulatory agencies were often lax in their investigation of the facility. State officials in Kentucky were unclear as to the control they could exercise over activities at PGDP; therefore, financial penalties for safety violations were insufficient to deter risky practices most efficient for achieving organizational goals (Gil, 2000).

Organizational Level of Analysis

At the organizational level of analysis, there is considerable evidence that organizational goals encouraged lax security practices and poor decisions regarding employee and environmental safety. While safety concerns surfaced periodically, the general practice at PGDP was to downplay these concerns and continue with the most economical approach. Indeed, it is possible that some reductions in security measures were meant to demonstrate to employees the degree of organizational confidence in safety at PGDP.

Motivation. Evidence reveals that despite knowing the health risks to employees, plant managers were motivated to pursue production goals at the expense of employee safety and failed to effectively communicate safety concerns to employees. The Department of Energy’s Office of Oversight reported that during the 1950’s:

(N)ot all workers had a clear understanding of the need to wear anti-contamination clothing. Contributing to this situation was the discretionary application of Carbide's policy on anti-contamination clothing and a non-conservative approach to the provision of company clothes...Carbide management sought ways to acquaint newly acquired personnel with known hazards without impacting production. (Office of Oversight, Environment, Safety and Health, 2000:38)

Opportunity structure. Plant administrators habitually ignored safety warnings and, when faced with alternatives, repeatedly chose hazardous means as the most efficient way to meet organizational goals. These practices increased the opportunity for employee exposure to hazardous conditions. From the beginning at PGDP, health and safety programs were in place, but were inadequate:

The Health Physics Section from the commencement of operations until 1990 ranged in size from as few as two to six employees. The Industrial Hygiene Section typically consisted of one or two industrial hygienists and a technician...in the early decades, health and safety professionals had limited authority and resources to ensure that line management would implement recommended hazard controls. (Office of Oversight, Environment, Safety and Health, 2000:36)

While training sessions were held to inform employees of hazards, the Office of Oversight (2000) team noted that from the 1950s to the 1960s the number of hours devoted to hazard communication declined by as much as 50 percent. Thus, as knowledge of the dangers of working with nuclear materials increased, PGDP management decreased the amount of safety training for employees, therefore increasing the opportunity for employee harm. Over time safety program training was replaced with on-the-job training as the principal means to keep workers informed of hazards at the plant (Office of Oversight, Environment, Safety and Health, 2000). Investigators concluded that by the 1980s employees were given *less* training than during the 1950s, despite the greater knowledge of danger. Investigators further stated that although there were written materials to educate employees about plant hazards "(t)here is no evidence of the extent to which this information was either made available or required reading, nor is there any indication of supervi-

sors' diligence in ensuring that Plant health and safety hazards were being communicated to workers" (Office of Oversight, Environment, Safety and Health, 2000:39).

Although contamination control was known to be important for employee safety, such practices were neither mandatory nor rigorously enforced until the mid-1980s. At times, management provided workers with incorrect information on contamination control, such as telling that uranium compounds were safe enough to eat (Office of Oversight, Environment, Safety and Health, 2000). Recommendations for safety and contamination control were sometimes ignored; for example, although it was recommended that employees wear respiratory protection devices, line managers did not always direct workers to follow the recommendation (Office of Oversight, Environment, Safety and Health, 2000). In some cases, management discouraged the use of protective clothing, and in one part of the plant (the C-720 Control Valve Shop) "evidence suggests that Paducah personnel routinely exceeded personal clothing contamination limits without corrective actions being taken by management" (Office of Oversight, Environment, Safety and Health, 2000:45). These organizational practices created the opportunity for individual employees to violate safety requirements and place themselves at considerable risk.

Social control. Social control was generally lacking as plant management failed to adequately implement safety training and enforce employee compliance with safety recommendations. The Office of Oversight investigators concluded that:

(i)mplementation of the radiological protection program at PGDP was very inconsistent between 1952 and 1989. Limited health physics staffing, a failure to communicate exposure levels and transuranic hazards to workers, worker failure to follow radiological control measures, a failure to consistently enforce radiological control measures, and a lack of adequate understanding and appreciation of the hazards of uranium and transuranics all contributed to inconsistent implementation. (Office of Oversight, Environment, Safety and Health, 2000:78)

Plant management created a climate in which workers trusted that what they were doing was safe, and by downplaying the need to wear protective clothing, contributed to an environment that did little to encourage the use of precautions. Secrecy made this climate easy for management to perpetuate due to the "need to know basis" of information about plant activities, and employee trust of

their employer (Office of Oversight, Environment, Safety and Health, 2000).

Interactional Level of Analysis

Motivation. At the interactional level, there was considerable motivation for PGDP employees to perform their assigned tasks. Employees had considerable financial motivation because they lived in an economically-depressed area before the opening of the gaseous diffusion plant. They were also socialized in an environment that assured the technology was safe and adequate protections were in place. Workers had additional motivation in the belief they were performing important tasks that contributed to national security.

Opportunity structure. At the individual level, there was considerable opportunity to engage in hazardous activity. It is apparent that workers were socialized into an environment in which illegal activities became the norm and were defined as acceptable methods for “getting the job done.” The absence of close supervision meant employees were given many opportunities to engage in hazardous activity.

Social control. From the beginning, PGDP employees had much to lose by refusing to follow organizational instructions; thus, it is not surprising that they engaged in questionable practices over an extended period. The economic climate meant employees could not afford to lose their sources of income. Individual workers employed a number of techniques of neutralization (Sykes and Matza, 1957) in performing their duties, including appeal to higher loyalties in the belief that their work was a patriotic duty benefiting the entire country. There was also no adequate system to control employee behavior and enforce safety guidelines. Employees were ill-informed of risks and left to make their own decisions about the need to take safety precautions. For these reasons, workers were denied the opportunity to make informed decisions concerning performance of duties and safety precautions.

Conclusion

Our examination of harms at PGDP leads us to conclude that as government behavior changes these harms constitute instances of *both* state-initiated and state-facilitated state-corporate crime. The U.S. government made the decision to locate a nuclear plant at the Paducah site and subsequently encouraged a generally lax attitude towards safety, and harmed plant workers by deliberately exposing them to materials known to be harmful.

Government also placed plant development ahead of environmental safety despite evidence of the inevitability of environmental harm. We find Kauzlarich and Kramer’s (1998) integrated theoretical framework to be very useful in clarifying the complex relationship between catalysts for action at different levels of analysis, and helps clarify the roles of the state, private corporations, and individual plant workers in the harms at PGDP. Analysis of events and harms at PGDP reveals change in state contribution to state-corporate crime. Specifically, utilizing the “complicity continuum” of state-corporate crime proposed by Kauzlarich, Mullins and Matthews (2003) we find the state role evolves from that of instigator to facilitator of state-corporate crime at PGDP. Over the life of the plant the state takes deliberate steps to transfer plant ownership and operation to private corporations and transforms its role to that of regulator; given the abysmal record of governmental efforts to enforce safety regulations at PGDP we believe its role clearly changes from that of instigator to facilitator of state-corporate crime.

Kauzlarich et al. (2003) further the study of state-corporate crime by locating it within a “complicity continuum.” That is, these authors distinguish types of state crime by highlighting state behavior. They emphasize that state crime arises from both state action (commission) and inaction (omission), and identify four distinct categories of state crime. *Explicit acts of commission* are the most extreme acts of deliberate state action towards clearly-specified goals, and are exemplified by the Holocaust (Kauzlarich et al. 2003: 248). *Implicit acts of commission* occur when “state agencies tacitly support actions which result in social injury, but their connection is more distant than proximal” (2003:248). Kauzlarich et al. identify state-initiated state-corporate crimes as examples of implicit acts of commission. *Explicit acts of omission* “occur when the state disregards unsafe and dangerous conditions, when it has a clear mandate and responsibility to make a situation or context safe” (2003:249). We believe state-facilitated corporate crime falls into this category. Finally, *implicit acts of omission* refer to more general harmful social conditions the state has the power to eliminate or reduce, such as economic inequality. Kauzlarich et al. note that by “doing nothing – or next to nothing – to ameliorate such problems, the state is engaged in crime because it is allowing institutions and actions to remain inadequate, harmful, and marginalizing” (2003:250).

Government efforts to change its role in nuclear plant involvement is clear from the passage of the *Atomic Energy Act* of 1954 that allowed private corporate involvement in the nuclear industry; ultimately at PGDP

this role change resulted in transfer of plant ownership and operation to various private corporations, with the state taking on responsibility for safety regulation. It is clear that dangers associated with the nuclear industry were known, and that through the *Atomic Energy Act* of 1954 the US government initiated participation of private corporations. Given the government's role in encouraging corporations to participate in a dangerous business, it was government's responsibility to implement and enforce strict regulations to ensure safety of nuclear plant employees and the public, however, government efforts were entirely inadequate and sanctions were rarely enforced for violations of safety standards. At the organizational level, while safety guidelines were developed, safety programs were inappropriately staffed, and it was generally left to line personnel to make sure that safety measures were being followed. Given the climate created by government and management, and the failure of government to regulate and enforce safety standards PGDP employees were unlikely to fully appreciate the dangers of their work and thus unlikely to take adequate precautions.

The *Louisville Courier-Journal* provides a good summary of the harms caused to PGDP workers as well as the community and surrounding area:

Sloppy safety practices, concealed health concerns, and decades of ignorance, expediency and poor oversight have left workers, nearby wildlife and the land itself damaged by chemical and radioactive toxins. Workers have inhaled the radioactive dust, chemicals have seeped into the ground water, and debris dumped off the site has created pockets of radiation. And the silent devastation is being seen in creatures ranging from insects to bobcats—an ominous warning to the humans who share the same soil, water, and air. (Carroll and Malone, 2000a)

In this case, as acknowledged by the federal government (Carroll, 2000c), a series of decisions from the governmental level to the plant operators ensured PGDP workers, the environment, and public safety were victims of state-corporate crime. Kauzlarich and Kramer's (1998) theoretical framework helps clarify how such harms come about, while Kauzlarich et al.'s (2003) "complicity continuum" highlights how the state role in state-corporate crime can change over time.

Endnotes

1. Since we are focused on how useful Kauzlarich and Kramer's (1998) integrated theoretical model of state-corporate crime is for understanding harm at PGDP we rely heavily on their work in defining the concept and framing issues discussed in the paper.

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