

When the Whistle Didn't Blow:
The Politics of Organizational Dissent at the Hanford Nuclear Site

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Abstract

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Beginning in the early 1970s, members of Congress and state legislatures enacted laws to protect workers who raise health, safety or environmental concerns. A right to voice concerns - either within or outside the organization - is particularly compelling in industries conducting activities that may harm the health and safety of workers, the environment, and perhaps even entire communities, ecosystems, and the economy. Despite legal protections, media accounts and government investigations often reveal that workers had knowledge of procedures or practices that were later identified as contributing factors to catastrophic accidents. But they were afraid to speak up.

One might ask, why, given a legal right to raise a concern without retaliation, would workers remain silent? This study seeks to answer that question by examining the political, regulatory and organizational context that either encourages or discourages workers from raising concerns, and how those circumstances vary across organizations.

The findings of this study suggest that whistleblower protection laws are one of many forces that come to bear on organizations that in turn, shape individual decision-making and action. Individuals perceive law as a thick mix of policies, directives, meanings, incentives, risks, and potential punishments - all filtered through the lens of their organizations. This study identifies three layers of influence including 1) the social, political and media attention in the organization's environment; 2) court decisions and oversight strategies employed by regulatory agencies; 3) and historical and cultural norms within the organization.

This study suggests that organizations play a fundamental role in institutionalizing perceptions about legal rights. It adds to an understanding of the constitutive power of organizations in shaping the meaning and impact of law. The evidence presented sheds new light on regulatory oversight and enforcement strategies that seek to affect this meaning-making process. Finally, this study concludes that formal legal rights to raise concerns are either dimmed or made real at the organizational level, where social, political and legal forces converge to convey the value of dissent.

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The first time I stepped foot onto the Hanford Nuclear Site in southeastern Washington State, I was transported into yesteryear. From the blocky reactor buildings perched on the banks of the Columbia River, to the stacks rising from concrete processing facilities and low-slung accessory buildings, the site appeared reminiscent of the era of secrecy and solemn purpose in which it was created. I stood in awe of what humankind had created there, and more importantly, of the bravery and ingenuity of generations of workers who have built, operated, and labored to clean up the 586-acre site. They are the ones who inspired this study, and to whom it is dedicated.

I owe thanks to many who helped make this study possible. I would like to first thank Michael McCann, my academic advisor and committee chair. Michael encouraged me to pursue an interesting and meaningful research question, even if it proved difficult and complex to answer. He helped me conceptualize this study, and expanded my thinking and inquiry in the early stages of its development. Later, he challenged me to reorganize, rethink, and refine my draft. My work on this project has benefitted from his intellectual leadership, patience, and mentorship. Other members of my committee - Peter May, Rachel Cichowski, George Lovell, and Stephen Page – all contributed to this study in important ways. Each provided suggestions and comments along the way, asked thoughtful questions that challenged my thinking and writing, and provided encouragement and support.

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daily life and decision-making within organizations performing some of the most dangerous and consequential work in our modern society. Through their efforts, the Hanford Site remains a place of unparalleled challenge and innovation. I sincerely hope this dissertation is worthy of their incredibly rich observations, perspectives, and wisdom.

I am also grateful for a supportive group of colleagues within my department who offered encouragement, advice, and a smile. Finally and not least, I am so very thankful for my husband, Bob Day, for his steadfast support and belief in me.

DEDICATION

For workers at the Hanford Nuclear Site and Columbia Generating Station

Chapter One

THE POLITICS OF DISSENT

It was nearly midnight on the back shift at the Hanford Nuclear Site in eastern Washington State. The desert air was warm on the night of July 27, 2007, as three workers struggled to restart a pump transferring high-level nuclear waste from one storage tank to another. The 586-square mile site, established during the Manhattan Project, is home to 56 million gallons of high-level nuclear waste stored in 177 underground tanks. Producing plutonium for World War II and the Cold War until 1988, the Hanford Site is now considered the most contaminated nuclear site in the Western Hemisphere, and presents the highest risk of all U.S. Department of Energy sites.

As the workers sought to restart the pump for the third time that night, they reviewed procedures, engineering reports, and readings from their instruments. Failure at any point in the process of restarting the pump and transferring the waste could result in serious injury or death, and localized or widespread environmental contamination. Their manager directed the workers to restart the pump manually. The directive was not consistent with standard operating procedures but these workers complied with the order. Within minutes, pressure in the transfer line caused it to rupture, leaking eighty-five gallons of high-level radioactive waste onto the desert floor and exposing workers to toxic vapors (Cram 2011; Department of Energy 2007).

This instance illustrates a technical failure of a mechanical pump. Yet a deeper inquiry into the incident might prompt one to ask why didn't these workers refuse to comply with the order? Use their authority to stop work? Go outside their chain of command to question the

order? Why, given a legal right to raise a concern without retaliation, did these workers remain silent? These are the questions that inspired this study and which it seeks to answer.

The importance of raising concerns is particularly compelling in industries conducting activities that may cause harm to the health and safety of workers, the environment, and perhaps even to entire communities, ecosystems, and the economy. These industries include energy exploration, generation and transport, nuclear energy and weapons production, air travel, and chemical manufacturing. Over the past few years, the media has detailed catastrophic accidents where workers had foreknowledge of practices, procedures or attitudes that could end in tragedy, but were afraid to speak up.

On April 5, 2010, an explosion at the Upper Big Branch Mine in West Virginia killed 29 miners. Days later, on April 20, 2010, an explosion on the Deepwater Horizon oil-rig in the Gulf of Mexico killed 11 workers and loosed the largest oil spill in U.S. history. Media accounts and government investigations later revealed that workers had knowledge of patterns of technical and operational failures that ultimately gave rise to both of these tragedies, but were afraid to speak out.

These instances are not unique, as other scholars have noted (for example, Hopkins 2008; Turner 1978). Hopkins states that prior to every major accident, “information was available somewhere in the organization pointing to the fact that trouble was brewing, but this information failed to make its way upwards to people with the capacity and inclination to take effective action” (2008, 114). Others have corroborated that workers are likely to remain silent despite their concerns and a legal right to raise them (for example, Dworkin and Near 1987, 1997; Miceli and Near 1992; Miethe 1999; Morrison and Milliken 2000).

Particularly in American society, with a focus on individuals and individual responsibility, it is tempting to assign blame to those front-line workers who were present at the time of an accident. Often formal investigations point to the actions of front-line workers as contributing to technical failures. In nuclear accidents such as Three Mile Island and Chernobyl, front line workers were blamed for errors in judgment. Workers' involvement in an incident or accident may also be denigrated by investigators or the media because they failed to "blow the whistle." In other words, workers may be blamed because they failed to report unsafe practices within or outside of their organization.

Scholarly evaluations and popular accounts of whistleblowers have traditionally focused on those who do raise concerns within or outside the workplace, and their motivations for doing so. A handful of studies have focused on similarly situated workers who have chosen to remain silent. But there appears to be very little scholarly inquiry into the social, political and organizational context that either encourages or discourages workers from raising concerns, and how those circumstances vary across organizations. This study seeks to fill those gaps.

The politics of dissent

On its face, the question of why insiders choose to remain silent seems an easy one to answer. Popular accounts and scholarly studies have illustrated the professional and personal costs to those who have spoken out against their organizations (for example, Alford 2001; Glazer and Glazer 1989; Johnson 2003). Despite formal legal protection, those who raise concerns are likely to face hostility, reprisals and retaliation by co-workers and managers (Devine and Maassarani 2008; Dworkin and Near 1987, 1997; Government Accountability Office 2009; Jos, Tompkins, and Hays 1989).

Scholars and whistleblower advocates have pointed to shortcomings in legal language and court interpretations of statutory law. One study concluded “statutes are not having their desired effect. They do not seem to be encouraging whistle-blowing. They are not being interpreted in a way that offers maximum protection to whistleblowers, and they are not drafted in a manner best designed to protect whistleblowers and to encourage them to report misconduct” (Dworkin and Near 1987, 263).

Socio-legal scholars might describe this view of law, and the experiences of whistleblowers, in terms of a gap between law on the books and law in action. These gaps result from intermediaries – in this case, government agencies or private organizations – translating legal rights into actual practice. The result of this translation creates chasms between statutory language and organizational cultures, or rifts between formal law and informal norms. This perspective reflects a theoretical vein of legal realism - an expectation that stated policy goals carry a force of law that does, or should, translate into enforceable rights in the workplace.

From this line of thinking, it follows that gaps between law on the books and in action result from an organization’s noncompliance with the law. Certainly for those insiders who have sought to claim rights under anti-retaliation laws protecting whistleblowers, those gaps are very real. This study doesn’t discount the experiences of those workers, or proposals for strengthening the structure and language of whistleblower protection laws.

Socio-legal scholars would not be surprised that workers who have raised concerns and suffered reprisals are hesitant to pursue a formal legal claim, or that their efforts to do so are unsatisfying. Similar to protections afforded under other employment laws, workers must first experience retaliation or discrimination in order to make a formal legal claim. Like others compelled to individual action to claim their rights, workers who have blown the whistle will

often simply “lump it” and move on because they are uncomfortable with being perceived as a victim, or due to their own sense of futility in the legal process (Bumiller 1988; Edelman 1992; Miller and Sarat 1981).

This comparison of whistleblowers to similarly situated workers or individuals suggests that whistle-blowing is a legally defined event, where an adverse action against an employee results from raising any protected concern. However, in this study, I conceive of whistle-blowing as a process, rather than a singular event. The process, in my view, begins with an individual noticing a specific situation, policy, or practice that concerns them. At this point, an individual is faced with a decision about raising that concern or remaining silent. This initial decision and the ensuing response by peers and supervisors are the focus of this study.

Specifically, I examine whether and how whistleblower protection laws affect decision-making by individuals within an organization. But rather than viewing the decision about whether to raise a concern from a perspective of a legal right, and presuming law plays a coercive role within organizations, I consider law as a constitutive force. In other words, I propose a view of law that, in its most influential form, fundamentally transforms decision processes and work practices. Further, it is most powerful when it changes expectations at all levels of the organization about whether and how dissenting opinions and legally protected concerns will be received and acted upon.

We might presume that the power of formal, legal protections pervades decision-making within an organization. For instance, we might imagine that every worker feels empowered to raise a concern, and that every line manager, supervisor, or senior executive understands these legal protections that are in turn, given priority in any given situation. Further, we might imagine that any form of retaliation is a sign of willful avoidance, evasion, or noncompliance with the

law. This depiction presumes that organizations are fully rational in the sense that decision-makers have access to, and are able to fully consider, the range of legal requirements, organizational goals, options, and potential outcomes.

A more accurate picture is one of “bounded rationality” where decision makers have limited information, imperfect capacity to process options, and limited time to make a decision (Simon 1957). Because individual decision makers in everyday situations don’t have the full set of data, or cognitive capacity needed to make optimal decisions, they develop heuristics for decision-making (Rojot 2008).

These heuristics, or decision shortcuts, include judgments about how closely one person or situation resembles another. Mental shortcuts also tend to favor causal arguments, such as the cause of certain scenarios or motives more heavily than abstract or technical evidence. Finally, the availability of information in collective memories can affect decision-making. So, organizations are more likely to weigh the likelihood of past events more heavily than speculated events, causing an underestimation of risk (Kahneman, Slovic, and Tversky 1982).

These mental shortcuts and frames hold important implications for the ways in which organizations respond to dissent internally. For example, peer groups and managers may react to the person who is raising concerns, rather than the concern they are raising. They are likely to rely on pre-existing perceptions of an individual, or resemblance to others who previously raised concerns. Similarly, they may attribute motives to the person raising a concern, rather than carefully examining the technical issue being raised. Finally, individuals pointing out the potential for a catastrophic event are likely to be met with skepticism, as such events are rare and not part of the collective memory of the organization. These reactions are based on human nature, and patterns of framing within the organization that can be difficult to overcome.

In addition to reliance on heuristics, organizational decision-making may more closely resemble a “garbage can” than rational model of choice. In a rational model, we presume that circumstances requiring a choice lead “first to the generation of decision alternatives, then to an examination of their consequences, then to an evaluation of those consequences in terms of objectives, and finally to a decision” (Cohen, March, and Olsen 1972, 2). In reality, decisions may instead result from “collections of choices looking for problems, issues and feelings looking for decision situations in which they might be aired, solutions looking for issues to which they might be an answer, and decision makers looking for work (Cohen, March, and Olsen 1972, 1). From this perspective, formal legal protections for individuals who raise concerns are simply one of many streams of requirements, problems, and priorities swirling about in a stew of potential responses.

The complexities of organizational decision processes form the context in which individual decisions are made. Individuals may be influenced by their peers to conform to the beliefs and actions of others in their group, making them hesitant to speak out even if they recognize the group’s conclusions are wrong (Asch 1951). Hierarchy and authority also affect how a person may respond to a given situation. Experiments in social psychology suggest that workers may go along with activities they perceive as unethical or dangerous in an organizational setting, when they might otherwise resist or voice dissent in a different setting (Adams and Balfour 2012; Haney, Banks, and Zimbardo 1973).

Dissent becomes even more difficult if unsafe, unethical, or illegal practices have been going on for some time (Adams and Balfour 2012) or if the political and social context surrounding the activities tacitly support them (Zimbardo 2007). In complex organizations, knowledge and responsibility is diffused, making it easy for those harboring concerns to simply

remain quiet. These dynamics create accepted patterns of practice and decision processes over time that can be difficult to change.

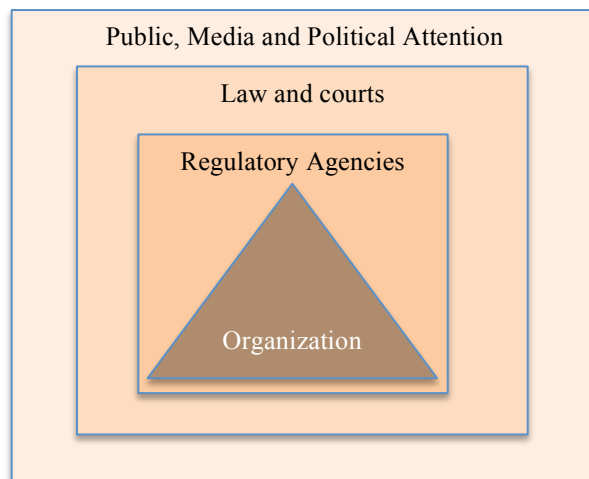
As organizations adapt to changes in law, extra-legal influences such as the organization's decision processes, heuristics, norms, and everyday practices shape those adaptations. In that sense, law in practice becomes embedded in the many forces within an organization that surround and envelop workers, creating an environment that either supports or discourages them from raising concerns.

While we expect formal legal protections to carry heft and authority, in fact, law may be one of many competing considerations for an organization responding to individuals who raise concerns. These concerns don't clearly identify themselves as legally protected. Rather, they arise amid everyday decisions about how to best resolve technical challenges and assess risks - requiring those in a position of authority to hear, recognize, and respond to them.

The view that organizations willfully evade legal mandates to protect dissenting workers can be a powerful moral or rhetorical position, and may actually be true in some cases. However, this view perhaps presumes that law is a powerful external force that comes to bear upon an orderly model of choice. This study builds upon less orderly and more complex models of organizational dynamics and decision-making. It assesses the ways in which law affects the workings of power, influence, and transformation (or the lack thereof) on individual perceptions and action. I posit that the true impacts of laws such as whistleblower protections are only realized when they are embedded within the existing decision processes, heuristics, and everyday practices of an organization. It is in this context that the effects of laws such as whistleblower protections take shape, and where their true impact is ultimately determined.

I arrived at this view of law as a result of my research at the Hanford nuclear site. There, I found that individual beliefs about the value of raising concerns emerge not solely from formal legal text, but from a complex array of pressures, issue framing, decision processes and external influences that collectively affect their decision-making. Specifically, I identified four layers of influence that affect law in practice including; 1) a broader social and political environment surrounding the organization, including Congressional attention, interests of local elected officials, and media coverage, 2) statutory law and court decisions, 3) regulatory rules and agency oversight, and 4) adaptations of legal mandates such as changes in formal policies and processes for resolving concerns. While I have separated these influences out for examination in this study, these layers are not separate but interrelated and nested within each other.

Figure 1.1: Illustration of the layers of influence on Individual decision-making



This conception suggests that law is not a top-down force to which organizations simply respond or evade, but an endogenous process of adaptation of law into practice. Organizational adaptations to legal mandates are prompted not just by statute, but by the social and political forces that gave rise to those statutes. Organizations are also influenced by industry and professional groups, and their adaptations are reinforced or de-legitimized through legal interpretations in the courts or agency enforcement. Finally, organizational norms evolve to cope with changes in legal mandates that sometimes conflict with or compromise the efficiency of operations and goals for profitability.

In complex organizations, these different layers - from official law to formal processes and informal practices and norms - construct the context in which individuals come to understand the true value of dissent. The thesis of this dissertation is that these dynamic layers together construct a world of norms, incentives, risks, myths, and supports, in which workers negotiate choices about whether and when to act. I posit that these layers of influence collectively form individuals' understanding about the "politics of dissent" within their organization, and inform their decisions about whether to raise a concern or remain silent.

The politics of dissent: a framework

The view of law I propose in this study builds upon aspects of socio-legal scholarship depicting law and individual rights as highly contingent upon broader social forces, norms, and everyday practice. This study adds to that literature, positing that rights are either dimmed or made real at the organizational level where social, political and legal forces converge to convey the value of dissent. This study is also grounded in the tradition of new institutionalism, envisioning organizations as complex social actors, influenced as much by their external

environments as internal norms, imperfect information processing and decision-making, risks, and incentives. I draw upon this literature, examining the extra-legal forces that come to play in legal practice as organizations adapt to laws such as whistleblower protections. Knitting these two traditions together, the following discussion suggests some important implications for a view of law as legal practice. In other words, a view that presumes there are always extra-legal forces at play in the implementation of law that shape and bend its meaning as it is put into practice.

Organizations embedded in a broader context

Building upon the tradition of new-institutionalism, this study furthers the notion that organizations are not closed systems where decision-criteria are based solely on internal functions and instrumental calculations alone. Rather, organizations are open or natural systems that influence and are influenced by political and media attention and changing societal expectations (Edelman 1990; Selznick 1949; Thompson 1967, 2010). Their adaptations to law reflect broader societal expectations, for example, for protection against retaliation and discrimination in the workplace.

For example, Edelman (1992) argues that organizations have adapted to equal opportunity laws in ways that signal compliance and support for protected groups of workers and consumers who had played a role in building momentum for new legislation. Similar to equal opportunity employment laws, organizational adaptations to whistleblower protections have included establishing new internal processes and procedures for resolving concerns and reconciling differing professional opinions. These kinds of changes have been described by Philip Selznick (1969) as a process of “legalization” where organizations adopt structural

changes that are “infused with value” and reflect societal expectations as much as to respond to new legal requirements.

Edelman and Suchman (1999) later developed Selznick’s conception of legalization by examining internal mechanisms for resolving complaints about employment rights violations. They found that knowledge of these mechanisms are shared among organizations through professional organizations and employment law attorneys, and ultimately tested in courts of law where judges often accept, and occasionally reject, the ways in which organizations have interpreted legislative intent and language.

As Edelman and Suchman have described, there are both benefits and drawbacks to this endogenous process where organizations are key players in defining compliance with the law. One drawback is that internal processes are often more symbolic than substantive, offering the appearance of due process while achieving little change in actual practices or compliance with employment laws (Edelman 1992). Internal processes may provide an illusion or “facade” that the organization has an orderly or “rational” decision making process, when in reality, these processes merely create a shield for “garbage can” decision making.

They can obscure the fact that “organizations continue doing some of the same old stuff despite pressures to change” (Abrahamson and Baumard 2008, 446). Further, organizations become powerful repeat players in the legal system, but more importantly, they define the very rules by which disputes will be resolved in these internal processes (Edelman and Suchman 1999). These processes, developed and supported by members of the organization, may only serve to perpetuate existing sources of power and framing of issues and individuals, and further discourage workers from raising concerns.

On the other hand, organizational processes that internalize due process mechanisms can result in changes in the belief structures within an organization. Although organizations may develop these processes simply to demonstrate compliance to external stakeholders and regulators, these “facades” may ultimately create a self-fulfilling prophecy. Managers feel compelled to meet the stated expectations, which can lead to changes in behavior over time.

The existence of a process for resolving complaints also creates an expectation of fairness among other members of the organization (Edelman, Uggem, and Erlanger 1999). This expectation can create a “symbolic feedback loop” that can transform an organization’s approach to compliance into “new policies, new outlooks, new structures and new personnel in ways that permanently alter the basic standards of practice throughout entire organizational fields (Edelman and Suchman 1999, 981). In that sense, even symbolic changes within an organization in response to external pressures can stimulate a new legal consciousness among the members of the organization that can ultimately result in substantive change.

This study builds upon the work of Edelman, Suchman and others, deepening an understanding of law as an endogenous process. By examining worker surveys and conducting interviews with workers, managers and union officials at the Hanford Nuclear Site, I came to understand the ways in which individuals experience law as legal practice within their organizations. I concluded that establishing internal processes for tracking and resolving concerns does result in changing expectations and sense of rights in the workplace. On the other hand, this study further develops a sense of skepticism about the substantive value of these formal responses.

I found that organizations such as the contractors and licensees at the Hanford site may have the best intentions in establishing processes such as employee concerns programs and

problem reporting databases. These processes often cite underlying whistleblower protection laws as their basis, and a means for encouraging workers to participate in improving safety. But these formal adaptations tend to be bureaucratic structures that derive from the organization's existing culture and values. At best, these processes may be poorly implemented or managed and, as a result, mistrusted by workers. At worst, these formal processes may simply perpetuate existing disparities in power among workers and managers.

This study shows that organizations can point to internal processes to demonstrate compliance before the courts and administrative agencies, while at the same time, discouraging the use of these processes as a way to silence dissenting voices within the organization. Based on my observations at Hanford, I conclude that organizations are most likely to discourage the use of these processes, and dissent generally, during times of heightened public or political attention, or regulatory scrutiny.

Depending upon the intensity of external pressures coming to bear on organizations, internal processes for tracking and resolving concerns may merely be a symbolic diversion, watering down and coopting the intent of protections for would-be whistleblowers. At the same time, these processes may be partly transformative the direction of the imagined original legal intent. The implication for individual workers is that law in practice becomes a set of paradoxical forces at play within their organization. When deciding whether to raise a concern or remain silent, workers are often confronted with mixed signals, requiring them to distinguish between the stated purpose of internal processes and reality of engaging them.

Courts, regulatory agencies, and individuals within a broader governance structure

This study evaluates legal practice within organizations by examining how whistleblower protection laws transform, or fail to transform, relationships and empower individual dissent within organizations. This approach inherently moves away from a more simplistic evaluation of whether organizations are complying with or evading whistleblower protection laws. Instead, it emphasizes an examination of everyday practice within the workplace, and the multiple forms of law that shape that practice. I draw upon the work of others who posit that law should not be conceived as a unitary force, but a constitutive force brought to bear through “capillaries of power” within a broader governance structure (Hunt 1993).

The stated goals of whistleblower protection provisions within twenty-one different Congressional statutes are generally to harness the expertise and ethics of individuals within organizations. The intent, outlined in the legislative history of these protections, is to ensure compliance with laws related to environmental protection, consumer and worker safety, and financial regulation. Policy-makers envisioned that individuals would exert pressure from the “bottom up,” at the same time courts, administrative agencies, and Congressional committees enforced compliance from the “top down.”

This study examines the role of each player within the broader governance structure. I show how the Department of Labor has at times, supported pro-dissident workers and expanded definitions of protected activity, for example, by offering protections for those who report concerns internally or to public interest groups and the media. At other times, delays in administrative decisions appear to favor organizational interests that seek to quell dissent.

At the Hanford nuclear site, two separate agencies are responsible for enforcing whistleblower protections outlined in the Energy Reorganization Act. The two agencies employ

distinctly different regulatory strategies, specifically through rule-making, incentives, and punishments for non-compliance. I found correspondingly different worker perceptions about the value of dissent within the regulated entities.

The interpretations of whistleblower protections by courts and agencies constitute multiple legal threads that at times conflict with one another. At times, they further the public interest of ensuring compliance and constructing a “culture of safety” within organizations. In other instances, they serve to further organizational interests related to production and profitability. Added to these mixed signals are the interests of local elected officials and the media, which also play a role in a larger governance structure, if from a greater distance, and exerting a less immediate form of influence.

Workers find themselves in a thick mix of legal directives and signals, where their concerns sometimes further the interests of elected officials and the public interest more generally. At other times, workers’ concerns may directly conflict with sustained funding from Congress, and the interests of private organizations and government agencies in reassuring the public that operations are safe.

In evaluating the players and interests in this governance structure, workers I interviewed seemed to be most attentive to agency oversight, assessing whether their concerns, if raised, might be addressed or ignored by regulators. Second, workers often noted the potential salience of an issue, the implications of media coverage, and whether a public airing of their concerns would be likely to foment change. Workers seemed to have little knowledge and place even less trust in legal forums as a force for ensuring their right to raise a concern.

An implication of these findings is that insiders can only be effective participants in a boarder governance structure if they receive support from regulatory agencies, the media and

elected officials, and the courts. Paradoxically, support for workers' concerns that potentially affect the public interest is likely to be at odds with organizational interests, for example, when production pressures are highest, contracts are up for bid, Congressional and media investigations are underway, or government bailouts are at stake. During these times, organizations are least likely to be receptive to individual concerns. Yet it is at times of heightened attention and high stakes that insiders are likely to bring about the kind of organizational change and pressure for compliance envisioned in whistleblower protection laws.

How history and culture matter in organizational adaptations of law

The history and culture of organizations form a prism through which its members adapt to laws such as whistleblower protections. This study suggests that organizations steeped in a tradition of secrecy and weapons production respond differently than those engaged in nuclear energy production. Over time, these two types of organizations have been heavily influenced by the obligations, rules and myths present at the time of their incorporation (March 1994; March 1988). Historical practices, procedures and decision-making criteria have become institutionalized in these organizations' bureaucratic processes, also described as programs or routines (March and Simon 1958; Nelson and Winter 1982). In that sense, an organizations' history, norms, meanings and practices can serve as a constraint when it comes to responding to a changing legal, social and political environment.

Every organization has its own unique culture, or "pattern of basic assumptions - invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration" (Schein 1985, 9). Schein suggests that the manifestations of culture include norms, dominant values, philosophy toward employees, and the

rules of the game for getting along in the organization. These differences in culture and its manifestations inform organizational heuristics and decision processes, which in turn, construction of the meaning of law as legal practice.

Legalization, or the development of new structures and processes within the organization in response to new laws may ultimately create a sense of rights or expectations among its members. As discussed above, even symbolic processes may create substantive change “in the shadow of the law” as employees gain awareness of their rights and managers recognize new responsibilities (Edelman and Suchman 1997). On the other hand, the everyday, informal patterns of communication and practice may suppress that recognition of new rights or a willingness to claim them.

Philip Selznick argues that examining written documentation and records is an important aspect of analyzing an organization. Yet he also recognizes the importance of the informal cultures or structures that can only be understood through personal interviews and interaction (Selznick 1949, 249). As Selznick argues, “...there will develop an informal structure within the organization which will reflect the spontaneous efforts of individuals and subgroups to control the conditions of their existence. There will also develop informal lines of communication and control to and from other organizations within the environment” (1949, 250).

Informal cultures exist within formal organizations and can't be identified by “an organization chart, its charter, rules and regulations, nor from looking at or even watching its personnel” (Barnard 1968, 99). Further, these groupings or informal societies established through everyday associations reinforce the authority and attitudes of dominant members (Barnard 1968). Informal organizations may be closely or loosely connected to the formal stated policies of the organization (Barnard 1968; Downs 1967; Meyer and Rowan 1977; Selznick 1949). Meyer and

Rowan suggest that informal organizations may only be loosely coupled to the formal organization because “rules are often violated, decisions are often unimplemented, or if implemented have uncertain consequences, technologies are of problematic efficiency, and evaluation and inspection systems are subverted or rendered so vague as to provide little coordination” (1977, 343).

This study builds upon these themes in the literature by examining the formal stated policies and standard practices of organizations at Hanford, as well as the informal cultures, signals and stories shared among individuals. I obtained documents outlining formal policies, rules, contract provisions and processes. I then compared and contrasted these aspects of formal culture with the stories, examples, and perceptions I gained through in-depth interviews. I found that informal signals and norms based on everyday patterns of communication, relationships, and folklore were important in creating perceptions of power and values among individuals. Even as formal policies have changed over time, these informal channels are deeply embedded in a status quo of secrecy over openness, and production over safety.

This study deepens an exploration of formal and informal cultures. I posit that informal cultures may be closely linked to the formal policies and practices of the organization during times where there is little external scrutiny or pressure on the organization. At other times, such as when an organization faces Congressional hearings, media attention, or increased regulatory oversight, they may be only loosely aligned. I determined this through an examination of the number of Congressional hearings and media articles, and through internal documents and other evidence in a specific instance of internal dissent. I concluded that when an organization is facing intense political, regulatory or media attention, informal avenues to quash dissent are more likely to be observed. In other words, when external attention to issues raised by insiders is

high, or likely to receive significant attention, managers and other organizational leaders are more likely to employ informal avenues to retaliate or otherwise silence voices of concern.

The politics of dissent at Hanford

The Hanford Nuclear Site is a juxtaposition of pride in the ingenuity of Americans to develop and test the first nuclear weapon, with a legacy of pollution and contamination. The Hanford site first produced plutonium during World War II, and production there sustained the arms race throughout the Cold War. After plutonium production ceased in 1988, the Department of Energy (DOE) was tasked with cleaning up the site. DOE has a dual responsibility for conducting the cleanup through contractors as well as regulating nuclear safety at the site.

Part of the site is leased to a public utility that operates a commercial nuclear plant used to generate electricity. Though technically situated on the Hanford site, commercial activities at the Columbia Generating Station are regulated not by the Department of Energy, but by the Nuclear Regulatory Commission (NRC). Workers at all areas of the site – both defense and commercial - are granted a legal right to raise concerns without fear of retaliation in the Energy Reorganization Act of 1954 as amended (ERA) and the Occupational Safety and Health Act of 1970. Workers may also raise concerns that are protected under certain environmental laws. Formal rights to raise concerns under the ERA are enforced by both DOE and NRC in their capacities as separate regulatory agencies.

The right to raise safety concerns is granted to individuals within a number of different private organizations that carry out the work of cleaning up the site, and a public-private entity that generates power. As such, the Hanford Site offers a rare opportunity to examine variation among organizations regulated by two separate agencies, but subject to the same whistleblower

protection law and situated within the same community. In this study, the organizations are the cases, or the “units of analysis.” Observations of these organizations and the stories told by individuals working at or associated with the site have shaped the insights and theoretical propositions that emerge from this study.

Interviews at the site revealed that the practical impact of whistleblower protections afforded in the ERA and OSH Acts were both gained and lost in the context of their own organizations. On the positive side, organizations embraced these laws as the basis for a “safety culture” which included changes in stated policies and values, and adoption of new internal processes for designing work and resolving concerns. In other instances, the purpose of these laws were lost or weakened within the context of informal cultures that discounted the value of safety concerns or of the person raising them.

Workers and managers interviewed for this study were both acutely aware of the political and community support for the mission at Hanford, and they believed those external considerations would influence their organizations’ responses to any concerns they might raise. In short, variations in the political environment and regulatory oversight, as well as internal cultures within their own organizations, led to differing perceptions among workers about the value of raising concerns, and their willingness to do so.

Talking with workers and managers revealed their view of whistleblower protection laws as somewhat distant from statutory requirements and individual legal rights. Rather, their decisions about raising concerns were significantly influenced by their assessment of the forces at play outside the organization, as well as cues from within about the value of dissent. Their decision criteria for determining whether to raise a concern included an evaluation of potential responses by the regulator, the potential salience of a safety issue, and the likely impact of media

coverage. Internally, they cited a number of important factors ranging from the personal relationship with their manager, to the formal processes for reporting concerns, and the symbols and myths that developed around daily practices.

Their understanding of law was not in the form of abstract statutory language. It was not understood as contestable or a force that could alter the balance of power within the organization. Rather, their understanding emerged from law transformed into practice –refracted through a lens of political and media attention, reshaped through internal policies and processes, and reconstructed within the informal cultures of their own organizations.

Methodology

This study proposes a general framework for understanding and tracing the role that organizations play in transforming law into legal practice. As a general framework, it seeks to identify actors that motivate action or change, as well as positing “general classes of variables that structure, constrain, guide and influence the actions taken by actors....” (Schlager 2007, 313).

From a social science perspective, this framework falls short in explaining causality. Rather than a linear process, this framework reflects endogeneity among the stages of the framework that resemble a more circular process. In other words, the framework seeks to capture the “ways in which law and organizations are dynamically intertwined” (Edelman and Suchman 1997, 479). In developing and applying this framework, I analyzed the following empirical evidence (see Research Journal in Appendix 1):

1. *History of the Hanford site, and the defense and commercial activities there.* Understanding the historical context required archival research about activities at the site and how it fits within the community as well as state and national political attention to nuclear activities over time. I conducted this portion of my research in public reading rooms for the Department of Energy (Richland, Washington) and the Nuclear Regulatory Commission (Rockville, Maryland) and reviewed secondary sources published by university and trade presses.

2. *Congressional record on the two whistleblower protection laws within this study.* This research included a review of the actual legislation, committee reports, hearings and communications from the president. Law review articles were helpful in summarizing how the courts and administrative agencies have interpreted these laws.

3. *Evidence of whistleblowing.* This evidence includes publicly available or accessible documents related to processes for raising concerns with regulators or filing formal claims for protection. It also includes data gathered through Freedom of Information Act requests from the Occupational Safety and Health Agency.

4. *Rule-making and other implementation and enforcement approaches.* A review of publicly available documents provided an understanding of the various approaches taken by the study agencies including rule-making, comments by stakeholders, final rules, and overall approach to incentive structures and enforcement. In addition, I reviewed the various internal characteristics of each agency including its history, mandate, authority, and leadership structure.

5. *Data that provide an understanding of the culture among Hanford contractors and at the commercial generating plant.* This includes DOE contracts and NRC licensing agreements, directives by DOE related to safe work environments, formal processes for encouraging workers to raise concerns internally, and training and materials provided to employees about safety priorities.

6. *Written employee surveys and assessments.* These surveys are publicly available or were provided by the five study organizations at the Hanford site. These documents provide insights into how individual employees perceive their legal rights within the context of the values, policies and practices of their organization.

7. *In-depth personal interviews.* I conducted a total of 30 interviews for this study. These interviews included current or retired workers, union representatives, and managers at the site who shared valuable insights about perceptions of whistleblower protection laws in the workplace, and their organization's responses to these laws. In addition, I also interviewed experts who are familiar with the Hanford site and its culture, including attorneys, advocates, and current or former regulators. These interviews provided a deeper understanding of how the political and regulatory environment shaped organizational responses and culture, as well as the ways in which organizations in turn shape the meaning and impact of those laws.

Case selection

This study examines the impact of whistleblower protection laws at a site in eastern Washington State. The site is the Hanford Nuclear Reservation, a 586-square mile site that

produced plutonium to supply the nuclear weapons arsenal from 1943 to 1988. The site is owned and operated by the Department of Energy (DOE), engaged now in a multi-billion dollar effort to remediate contaminated soil and groundwater, and to stabilize 56 million gallons of high-level nuclear waste for long term storage. Some aspects of DOE activities are overseen by the Defense Nuclear Facilities Safety Board (DNFSB), which was established by Congress in 1989. The Board is not a traditional regulatory agency, but does have the power to hold hearings, offer technical assistance, and make recommendations to which DOE must respond.

The Department of Energy has two field offices in eastern Washington. The DOE Richland Office (DOE-RL) oversees demolition of facilities and remediation of contaminated soils and groundwater. The DOE Office of River Protection (DOE-ORP) oversees efforts to stabilize and store high-level nuclear waste in 177 underground tanks that are considered a threat to the Columbia River. Both DOE offices conduct cleanup activities by hiring and managing contractors. There are seven “prime” contractors at the Hanford site. Two contractors overseen by each DOE office were selected for this study, for a total of four.

A portion of the Hanford site is leased to Energy Northwest, a not-for-profit commercial nuclear generating plant that began producing electricity in 1984. The Columbia Generating Station operated by Energy Northwest produces 1,150 megawatts of power and is the only commercially operated nuclear facility in the Northwest. Commercial nuclear activities are regulated by the Nuclear Regulatory Commission (NRC). Energy Northwest is the fifth organization included in the study.

Organizations are the unit of analysis for this study. In total, this study analyzes three regulatory agencies overseeing the activities of five regulated entities. Workers at both the defense and commercial sites are entitled to whistleblower protection under the Occupational

Safety and Health Act of 1970, and the Energy Reorganization Act of 1974, as amended, as well as a number of environmental protection laws.

These five cases offer a rich opportunity to examine the effects and effectiveness of whistleblower protection laws. Although they exist within the same geographic area and community, many factors within their organizational environments differ dramatically. Similarly, the approaches taken by agencies overseeing operations at these sites and the ways in which regulated entities respond also differ. These differences result in perceptions of whistleblower protection laws that vary in complex and subtle ways among members of each organization.

Organization of the dissertation

Chapter two outlines the history and intent of the two whistleblower protection laws examined in this study. It describes key features of the laws and how claims filed under these laws are adjudicated. This chapter describes how changing social expectations gave rise to new laws, and how they construct and empower a broader governance structure. It also sets the stage for understanding the specific legal rights granted to individuals for reporting concerns inside or outside the organization without fear of retaliation.

Chapter three explores the way in which organizations shape and are shaped by the broader social and political environments at Hanford. It draws specifically on the history of nuclear activities at the Hanford site, and illustrates the forces that came to bear on the regulatory agencies and their contractors or licensees over time. Ultimately, these social and political considerations become part of the consciousness of every individual within regulated entities, and their decisions about raising concerns are influenced within this broader context.

Chapter four analyzes the different approaches taken by the regulatory agencies in this study in translating and enforcing whistleblower protection laws. The data reveal different regulatory crafts, and corresponding variation in levels of influence over change within the regulated organizations. Part of this analysis includes an examination of how these agencies came to translate whistleblower protections under ERA into rules, and how they developed enforcement strategies based on their own internal characteristics and influences from their own environments. It summarizes the approach taken by each agency, resulting in very different incentive structures for regulated entities to respond to whistleblower protection laws.

Chapter five illustrates the way in which organizations construct the meaning and impact of law through their responses to it. It shows that organizations respond differently to external pressures through the filter of their own internal cultures. As organizations respond by creating formal processes for reporting and resolving concerns internally, they construct the meaning of the law through symbolic gestures of compliance. The formal processes, and informal responses to them, give rise to everyday understandings among workers about their right to raise concerns.

Chapter six illustrates how members of an organization come to view the law in the context of their own organization's environment and responses to law. It shows how formal stated policies and informal channels of communication and daily activities converge to shape a worker's willingness to raise concerns. This chapter also shows that workers respond not just to signals from within their own organization, but to those from within the broader governance structure.

The final chapter pulls together the pieces of the framework and empirical findings. It closes with a summary of lessons learned from this study.

Chapter Two

INTERPRETING AND TRANSFORMING WHISTLEBLOWER PROTECTIONS

“We believe notification to the foreman of possible dangers is an essential preliminary stage in both the notification to the Secretary (A) and the institution of proceedings (B), and consequently brings the protection of the Safety Act into play.”

D.C. Circuit Court of Appeals in *Phillips v. Interior Board of Mine Operations Appeals* (1974)

Whistleblowers have gained prominence in the media over the past months and years. In 2002, *Time* magazine named Sherron Watkins of Enron, Coleen Rowley of the FBI and Cynthia Cooper of WorldCom persons of the year after they blew the whistle on misconduct within their organizations. Most recently, National Security Administration contractor Edward Snowden publicly revealed secret surveillance activities by the agency. The actions of these individuals came at a time of heightened public and political attention to corporate practices that led to astonishing collapses by publicly traded companies, missed opportunities to prevent the terrorist attacks of 9/11, and most recently, to the secret activities undertaken by the U.S. government. But whistleblowers haven't always garnered such attention or respect.

Rising concerns or reporting them outside of one's own organization could be considered anathema to traditional American values. Those who blow the whistle may be likened to a tattletale or snitch. Solving one's own problems and not airing dirty laundry outside the family or organization are simple ideological tenets that most Americans can relate to. These deep-rooted values and ideologies can carry over into the workplace as heuristics, often causing those who raise concerns to be dismissed as troublemakers, those who are doing poorly in their jobs, or motivated by self-interest.

Based on interviews conducted for this study, negative perceptions about those who

report concerns are not exclusive to management, but are also often held by fellow workers, historians, and others outside the organization. These deep and often strongly held beliefs about reporting misconduct or noncompliance can prompt organizations to focus on the individual, rather than on the concerns they are raising. For example, managers and co-workers may cast those who raise concerns as people who can't get along, or at worst, miscreants who are revealing privileged company information or compromising national security. This despite a number of studies that show workers who "blow the whistle" are generally conservative people who have been successful in their jobs (see for example, Glazer and Glazer 1989; Miceli, Near, and Dworkin 2008).

While organizations may demonize workers who raise concerns outside the organization, these same workers are often heralded by the media, policy-makers and regulatory agencies for their ability to bring to light harms to the environment, unsafe working conditions, and threats to consumers or communities. This chapter seeks to reconcile these disparate views of people who raise concerns, and show how changes in how Americans view dissent in the workplace have resulted in sweeping legislative action to protect whistleblowers over the past 40 years. In addition, this chapter shows how courts and administrative agencies have both broadened and limited the impact of these laws. While these pressures come to bear on organizations over time, changes in societal expectations and legal mandates may be slow to change the inner workings and relationships among members of organizations.

Cyert and March (1963, 1992) have noted that organizations don't have goals or make decisions, only individuals do these things. Yet individuals are in positions of authority, and their decisions become analogous to organizational-decision making. We know that individuals have cognitive limitations for making rational decisions, or in other words, capacity to know and

process data and weigh alternatives (March 1988; Simon 1957). Given the complexity of new statutory requirements, court decisions, and regulatory rule-making, it is possible that individuals “continue to behave as they have been behaving even when continuation and escalation may be irrational” (Rojot 2008, 157). So, changes in laws may not be incorporated into perfectly rational decision-making by organizations.

In this chapter, I presume that the costs and benefits imposed by changes in law and legal interpretation are imperfectly incorporated into organizational decision-making. At the same time, I suggest that these changes can ultimately affect the underlying assumptions and heuristics employed by decision-makers. I begin by tracing changes in the social and political context in which the phenomenon of whistle-blowing emerged, and how this context has led to an ever-increasing number of formal legal protections for those who raise concerns in the workplace. Next, I describe some of the provisions of environmental and worker safety laws enacted during the 1970s that include whistleblower protections, and compare those to protections embedded in more recent legislation. Finally, I show how courts and administrative law judges have increasingly empowered regulatory agencies and private organizations to resolve whistleblower concerns and claims of retaliation internally.

The chapter concludes with an analysis that pulls these strands together and suggests the strength of the law in terms of worker protections (such as burdens of proof, standards of evidence, restitution, statutes of limitations, and right to a jury trial) do not necessarily correlate with whether and how organizations implement these laws. Rather, I show that other contextual factors such as broader societal beliefs and expectations, and political and media attention are a more reliable indicator of outcomes. In other words, these extra-legal influences shape the ways in which law is transformed into legal practice within organizations. This analysis sets the stage

for the following chapter, which demonstrates more specifically how these factors have influenced the organizations in my study of Hanford.

The emergence of whistleblower protection laws

The term whistleblower is relatively new, particularly as it relates to formal legal rights. The term emerged years after the first worker protection and environmental laws were passed that contained language protecting workplace dissenters the early 1970s. Specifically, the first laws to include formal legal protection for workers who report noncompliance with health and safety laws, or threats to public safety, were buried within the text of broader legislation such as the Occupational Safety and Health (OSH) Act of 1970, the Energy Reorganization Act (ERA) of 1974, and environmental legislation such as the Federal Water Pollution Control Act of 1972 (the Clean Water Act), Safe Drinking Water Act of 1974, and the Clean Air Act of 1977. Later, whistleblower provisions were included in laws related to consumer safety, transportation and fraud prevention. With the exception of laws related to federal workers and civil service, the term “whistleblower” is absent from the legislative histories and the text of the laws enacted during the 1970s and early 1980s.

Although the term whistleblower hadn't yet been coined legislatively, the impetus for the earliest whistleblower laws is evident in what some have described as a social movement demanding greater accountability from industry and government bureaucracies (Glazer and Glazer 1989). Whistleblower protections emerged during a time of growing mistrust of industry and government, specifically, their ability to control and regulate technological hazards. Glazer and Glazer argue, “Public concern about nuclear accidents, dangerous drugs, and toxic waste led to government regulation of private industry, spawning a host of new laws that explicitly protect

workers who report lawless actions in the workplace. In this same period, there was increasing suspicion that many of the accepted practices of government and industry officials were insufficient to guard against the dangers of new technologies and, in some cases, actively threatened the health, and safety of workers and consumers” (1989, 6).

During the early 1970s, the U.S. political establishment was rocked by the publication of the Pentagon Papers by the *New York Times* and the Watergate scandal. Daniel Ellsberg, then a contractor at the Rand Corporation, became convinced of the folly of U.S. involvement in the Vietnam War. Ellsberg’s efforts to bring attention to the top-secret study were rebuffed by leaders of Congress and Secretary of State Henry Kissinger. Amid an active anti-war movement, Ellsberg turned to the media to publicize the findings of the 7,000-page study. The *New York Times* published the first front-page article in June of 1971. A year later in June of 1972, President Nixon was implicated in a break-in at Democratic National Committee headquarters in the Watergate hotel and office complex.

The subsequent investigations and Nixon’s 1974 resignation were chronicled in the *Washington Post*, aided in part by a confidential internal source who until recently was simply known as “Deep Throat.” These watershed events marked a low point in Americans’ trust in government. Corruption in the Nixon Administration and revelations of the My Lai massacre fomented distrust of government authority that had enjoyed a high point in the years following World War II. Bureaucratic institutions came to be seen not as trusted agents of government, but complex structures that masked accountability and enabled abuse of authority. This shift also signified a turning point in the esteem given to insiders who release information to the media and ultimately the public, and in their motivations for doing so (See Glazer and Glazer 1989; Vaughn 2012).

The early 1970s was also characterized by an emerging environmental consciousness and ongoing struggle over environmental policies. Public support for new environmental and worker protection legislation was fueled in part by the publication of Rachel Carson's *Silent Spring* in 1962, well publicized instances of contamination such as at Love Canal, and scientific studies that increasingly questioned whether the government was doing enough to protect the health of workers and communities.

Provisions within newly enacted environmental laws to protect workers who report violations to members of Congress or regulatory agencies suggest policy-makers' expectations that individuals within an organization would effectively become part of a broader governance structure. Kohn and Carpenter note, "Congress was looking to workers to help enforce the nation's environmental laws" (1986, 16). Defending an amendment to an environmental protection law, one member of Congress stated, "The best source of information about what a company is actually doing or not doing is often its own employees and this amendment will ensure that an employee could provide such information without losing his job or otherwise suffering economically from retribution from the polluter."¹

Finally, this period in time marked an unprecedented new emphasis on social regulation, ultimately changing the relationship between business and government. New agencies such as the Occupational Safety and Health Agency, the Environmental Protection Agency, and the Equal Employment Opportunity Commission established in the early 1970s emerged as a powerful political force and garnered suspicion and resentment from regulated entities. Corporations decried the rapid growth of agency budgets, and executives estimated the cost of new health, safety and environmental regulations to cost between \$58 and \$100 billion annually

¹ Legislative history of FWPCA cited in Conference Report of Clean Air Act, 1977 U.S. Code Cong. & Ad. News, 1077, 1404

(Inner Circle, 162).

At the same time, a vibrant public interest community emerged, including newly formed environmental groups and whistleblower advocates such as the Government Accountability Project and Public Citizen. These groups engaged in lobbying and litigation, and their assistance aided insiders in reporting misconduct or noncompliance outside of their organizations. Yet there is little evidence in the legislative histories of these laws of organized influence or model legislation proposed by public interest groups. Instead, the record of Congressional debate and deliberation on whistleblower provisions is relatively thin.

Newly formed regulatory agencies provided an important new venue for reporting by insiders. As this study suggests in Chapter Four, the ways in which regulatory agencies respond to whistleblower protection laws are important for determining their efficacy. The Occupational Safety and Health Administration, and in some cases the courts, were tasked with adjudicating claims related to newly enacted whistleblower protections. As I discuss in the following section, the relatively broad protections granted in the legislation, and the relatively thin record of Congressional intent, has resulted in broad discretion for adjudicators, regulatory agencies, and regulated organizations to interpret the intent and make real the impact of these laws.

The Energy Reorganization Act of 1974

The earliest whistleblower protections contained similar provisions. For example, the legislative history of an amendment creating section 211 of the Energy Reorganization Act (ERA) reads: “This amendment is substantially identical to provisions in the Clean Air Act and the Federal Water Pollution Control Act. The legislative history of those acts indicated that such provisions were patterned after the National Labor Management Act and a similar provision in

Public Law 91-173 relating to the health and safety of the Nation's coal miners" (Kohn and Carpenter 1986, 14).

In addition to ERA, whistleblower protections in four other environmental laws were modeled after the Federal Water Pollution Control Act, Toxic Substances Control Act, Comprehensive Environmental Response, Compensation and Liability Act (Superfund), Safe Drinking Water Act, and the Solid Waste Disposal Act. Whistleblower protections were not exclusive to a particular class of employees, suggesting a legislative intent to broadly apply to all those employed by local, state and federal governments as well as private companies. Collectively, the legislative histories of the Clean Air and Water Acts signaled "Congress' intent to aggressively protect environmental whistleblowers" (Kohn and Carpenter 1986, 76).

The provisions focused on preventing economic retaliation against workers for reporting noncompliance with these laws. During debate over proposed amendments to the Federal Water Pollution Control Act, one member of Congress stated, "Mr. Chairman, in offering this amendment we are only seeking to protect workers and communities from those very few in industry who refuse to face up to the fact that they are polluting our waterways, and who hope that by pressuring their employees and frightening communities with economic threats, they will gain relief from the requirement of any effluent limitation or abatement order."² In short, members of Congress intended to protect workers from retaliation, and to ensure that the threat of economic retaliation could not "silence the disclosure of environmental concerns" (Kohn and Carpenter 1986, 76).

As with other environmental laws, Congress' stated intent was to broaden the regulatory regime enforcing laws to protect the environment and worker safety. Section 210 (later 211) of

² William D. Ford (D-Mich) Cong. Rec. 10,766-10,768 (1972) reprinted in Legislative History of the Water Pollution Control Act Amendments of 1972, at 655.

the Energy Reorganization Act included a “broad, remedial purpose of protecting workers from retaliation based on their concern for safety and quality.” The Senate report went on to state, “Under this section, employees and union officials could help assure that employers do not violate requirements of the Atomic Energy Act. Any worker who is called upon to testify or who gives information with respect to an alleged violation of the Atomic Energy Act or a related law by his employer or who files or institutes any proceeding to enforce such law against an employer may be subject to discrimination. This section would prohibit any firing or discrimination and would provide an administrative procedure under which the employee or his representative could seek redress for any violation of this prohibition.”³

The provisions to protect workers who would report wrongdoing or noncompliance related to nuclear activities were embedded in much broader legislation that included the formation of new regulatory agencies to oversee nuclear activities. The stated purpose of the Energy Reorganization Act was in part to “...increase the efficiency and reliability of use of all energy sources to meet the needs of present and future generations, to increase the productivity of the national economy and strengthen its position in regard to international trade, to make the Nation self-sufficient in energy, to advance the goals of restoring, protecting, and enhancing environmental quality, and to assure public health and safety.”⁴

The Energy Reorganization Act (ERA) provided whistleblower protections for workers at commercial nuclear sites and authorized the formation of the Nuclear Regulatory Commission (NRC) to oversee commercial nuclear activities. These protections would later be amended to

³ S. Rep. No. 848, 95th Cong., 2nd Sess. at 29, 1978 U.S. Code Cong. & Admin. News, 7303, 7304.

⁴ P.L. 93-438, section 2

include protections for workers at defense sites such as Hanford, regulated by the Department of Energy (DOE). Section 211⁵ of the Energy Reorganization Act of 1974, as amended, states:

(1) No employer may discharge any employee or otherwise discriminate against any employee with respect to his compensation, terms, conditions, or privileges of employment because the employee (or person acting pursuant to a request of the employee)

(A) notified his employer of an alleged violation of this Act or the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.);

(B) refused to engage in any practice made unlawful by this Act or the Atomic Energy Act of 1954, if the employee has identified the alleged illegality to the employer;

(C) testified before Congress or at any Federal or State proceeding regarding any provision (or proposed provision) of this Act or the Atomic Energy Act of 1954;

(D) commenced, caused to be commenced, or is about to commence or cause to be commenced a proceeding under this Act or the Atomic Energy Act of 1954, as amended, or a proceeding for the administration or enforcement of any requirement imposed under this Act or the Atomic Energy Act of 1954, as amended;

(E) testified or is about to testify in any such proceeding or;

(F) assisted or participated or is about to assist or participate in any manner in such a proceeding or in any other manner in such a proceeding or in any other action to carry out the purposes of this Act or the Atomic Energy Act of 1954, as amended.

⁵ Sec. 211, formerly Sec. 210, was added by P.L. 95–601, 92 Stat. 2951 (1978). It was renumbered as Sec. 211 by P.L. 102–486, 106 Stat 3123 (1992).

By establishing new regulatory agencies and empowering workers to report wrongdoing, Congress effectively expanded a governance structure that could bring pressure to bear on organizations to operate safely. It increased the number of venues for reporting concerns, and signaled the importance of individuals at all levels of an organization for ensuring the safety of workers, the public and the environment. In reviewing the specific language of the legislation, it appears as though Congress envisioned a protected channel linking individuals inside organizations with newly formed regulatory agencies, Congressional oversight committees, and public interest groups. Pressure to comply, in this conception, would come from the bottom up, within organizations, as well as from top down, outside the organization.

Occupational Safety and Health Act of 1970

It is a bit surprising to look back at the genesis of the Occupational Safety and Health (OSH) Act, which included some of the first legal protections for whistleblowers reporting on matters of health and safety. On August 6, 1969, President Nixon, a Republican, forwarded the proposed legislation to members of Congress. The proposal, prepared by Secretary of Labor George Shultz, would establish the Occupational Safety and Health Administration, a national committee that would provide advice on administration of the Act, and opportunities for states to establish their own enforcement agencies funded by federal grants. The legislation, Nixon asserted, would focus not just on workplace accidents, but cumulative workplace exposures and hazards that could harm working men and women. “For them, Nixon said, “the quality of the

workplace is one of the most important of environmental questions. The protection of that quality is a critical matter for government attention.”⁶

President Nixon also acknowledged the advances in technology that allowed for economic progress, but which also required new oversight to ensure worker safety. He stated, “The side effects of progress present special dangers in the workplaces of our country. For the working man and woman, the byproducts of change constitute an especially serious threat. Some efforts to protect the safety and health of the American worker have been made in the past both by private industry and by all levels of government.

“But new technologies have moved even faster to create newer dangers. Today we are asking our workers to perform far different tasks from those they performed five or fifteen or fifty years ago. It is only right that the protection we give them is also up-to-date.”⁷ Nixon’s comments acknowledged a growing public concern over the government and industry’s ability to control technological hazards, and to protect workers and the environment.

When Congress passed the OSH Act in 1970, its stated purpose was to “to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources.”⁸ The Act sought to achieve this goal in part by “providing that employers and employees have separate but dependent responsibilities and rights with respect to achieving safe and healthful working conditions.”⁹ Congress granted workers the right to file a complaint, initiate or cause the initiation of a proceeding, or testify about any aspect related to the Act. Section 11(c) of the Occupational Safety and Health Act of 1970 states:

⁶ Letter from President Richard Nixon to the House Committee on Education and Labor, August 6, 1969.

⁷ Id.

⁸ P.L. 91-596, section 2

⁹ Id.

11 (c) (1) No person shall discharge or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to this Act or has testified or is about to testify in any such proceeding or because of the exercise by such employee on behalf of himself or others of any right afforded by this Act.

(2) Any employee who believes that he has been discharged or otherwise discriminated against by any person in violation of this subsection may, within thirty days after such violation occurs, file a complaint with the Secretary alleging such discrimination. Upon receipt of such complaint, the Secretary shall cause such investigation to be made as he deems appropriate. If upon such investigation, the Secretary determines that the provisions of this subsection have been violated, he shall bring an action in any appropriate United States district court against such person. In any such action the United States district courts shall have jurisdiction, for cause shown to restrain violations of paragraph (1) of this subsection and order all appropriate relief including rehiring or reinstatement of the employee to his former position with back pay.

(3) Within 90 days of the receipt of a complaint filed under this subsection the Secretary shall notify the complainant of his determination under paragraph 2 of this subsection.

Congress was initially divided over how to resolve claims of retaliation protected under section 11(c). The Senate version initially provided for review by the Secretary of Labor, public hearings, and a decision and order reviewable by a federal circuit court of appeals. The Senate

later amended the bill, instead creating the Occupational Safety and Health Review Commission that would provide an administrative trial and appellate review.

The House version provided for civil and criminal penalties to be levied against any person discriminating or discharging an employee whose disclosures were protected under 11(c). The conference committee adopted the Senate's approach, but included a provision authorizing the Secretary of Labor to bring 11(c) actions before a district court after an initial finding that the case was valid.¹⁰ The final version included no private right of action for a worker to bring a suit in court. Instead, a worker who believed their rights had been violated under this section of the Act would have to rely on the determination of OSHA that a violation had taken place, and the Secretary to bring action in court.

Cases brought under 11(c) were (and are) limited to administrative review and adjudication. Any claim made under 11(c) is investigated by the Department of Labor's Occupational Safety and Health Administration. Decisions by the quasi-judicial Occupational Safety and Health Review Commission may be appealed to Office of Administrative Law Judges (OALJ) and, ultimately, to the Administrative Review Board (ARB). Cases brought under whistleblower provisions in other laws such as the ERA, may be reviewable in the circuit courts of appeal. Most recently, the Energy Policy Act of 2005 mandated that workers filing under ERA may file a claim in court if the Occupational Safety and Health Administration has failed to make a determination on the case within one year of filing.

¹⁰ See S. Rep. No. 1282, 91st Cong., 2d Sess. 34-35, reprinted in [1970] U.S. Code Cong. & Ad. News 5177, 5211.
See S. 2193, 91st Cong., 2d Sess. § 10(f) (1970), reprinted in Legislative History, supra note 28, at 557-58.
See H.R. 16785, 91st Cong., 2d Sess. § 17(g) (1970), reprinted in Legislative History, supra note 28, at 1104.
See H.R. Rep. No. 1765, 91st Cong., 2d Sess. 39 (Conference Report), reprinted in [1970] U.S. Code Cong. & Ad. News 5228, 5235-36.

Over time, the courts, Occupational Safety and Health Agency, and other administrative agencies have broadened the reach of these laws, while in other instances, they have limited their impact. The following discussion shows how these Congressional statutes and the courts have devolved power to regulatory and administrative agencies, and regulated organizations to determine the meaning and intent of whistleblower protections.

Responses by courts and OSHA

Whistleblower protections under both ERA and the OSH Act prevent retaliation for reporting misconduct or noncompliance. Such reporting is considered “protected activities” that include: 1) Providing information to a government agency, 2) Filing a complaint or initiating a proceeding, 3) Testifying in proceedings or participating in investigations, and 4) Refusing to engage in work practices the employee believes, in good faith, is unlawful, unsafe, or unhealthful. Employers are prohibited from taking “adverse action” against employees who engage in protected activities. Adverse action is broadly defined and can include harassment, hostile work environment, negative performance evaluations, demotion, transfers, layoffs, or firing (Occupational Safety and Health Administration January 18, 2011).

The Occupational Safety and Health Administration is authorized to resolve claims brought under any of the 21 laws containing whistleblower protections. As outlined in the Whistleblower Investigations Manual (Occupational Safety and Health Administration 2011), claims managers are to determine whether there is a nexus between protected activity and adverse action, however, standards of evidence differ depending upon the statutes. For example, under the OSH Act, a worker must prove that the worker’s protected activity was a “motivating factor” in the employer’s adverse action. Claims brought under ERA must prove that the

worker's protected activities were a "contributing factor" in the employer's adverse action. In other words, the standards under ERA are considered to be more favorable to the employee.

Other differences between the two statutes include the time period for filing a claim with OSHA, the time required for OSHA to make a determination, the remedies available to a worker, and as noted above, the right of private action and appeals. Given the features of these two laws, ERA is generally considered to be a stronger law than the OSH Act for protecting the rights of workers.

Table 2.1: Comparison of whistleblower protection provision in the Occupational Safety and Health and Energy Reorganization Acts

	Occupational Safety and Health Act (OSHA 11(c)), 29 U.S.C. §660(c)	Energy Reorganization Act (ERA) , 42 U.S.C. §5851
Applicability	Employees in the: Private sector Non-federal public sector Postal service	Employees of: NRC and its licensees, applicants, contractors and subcontractors DOE and its contractors and subcontractors
Statutory time limits to file complaint	30 days	180 days
Statutory time requirements for OSHA to investigate	90 days	30 days
Protected Activity	1. Providing information to a govt. agency 2. Filing a complaint or initiating a proceeding 3. Testifying in proceedings or participating in investigations 4. Refusing to engage in work practices the employee believes, in good faith, is unlawful, unsafe, or unhealthful	1. Providing information to a govt. agency 2. Filing a complaint or initiating a proceeding 3. Testifying in proceedings or participating in investigations 4. Refusing to engage in work practices the employee believes, in good faith, is unlawful, unsafe, or unhealthful
Burden of proof	Protected activity was a “motivating factor” for adverse action	Protected activity was a “contributing factor” in adverse action
Appeal of DOL decision	Appeals Committee reviews case file, findings and application of law	De Novo review by Administrative Law Judge, then Circuit Court of Appeals
Remedy	Compensatory damages, Reinstatement, Punitive damages	Compensatory damages, Reinstatement, Attorney’s fees

Source: Occupational Safety and Health Administration. 2011. *Whistleblower Investigations Manual*. Directive Number: CPL 02-03-003

Court interpretation

As with other labor laws, the courts and administrative agencies have played an important role in interpreting Congressional intent through the administration and adjudication of whistleblower protections. Important questions have arisen before the courts such as whether an employee is protected if he or she reports concerns or allegations to the media or public interest groups that in turn, causes an action? What about reporting internally to a supervisor? Finally, what about the limitations on the capacity of OSHA to review and adjudicate claims? The following discussion shows that both the courts and administrative agencies have broadened the intent of whistleblower protections expanding the obligations of organizations to recognize, process, and resolve concerns without taking real or perceived adverse action against those who raise them.

Reporting to third parties

“Whistleblowing’ has been defined as the act of disclosing any information that an employee reasonably believes evidences a violation of any law, rule or regulation, mismanagement, corruption, abuse of authority, or threat to public health and safety at the worksite” (Kohn and Carpenter 1986, 74). However, the ERA and OSH Act did not explicitly identify to whom a worker could report and be protected under these provisions, at least not in the initial version of the legislation. Since the passage of whistleblower protections in the ERA and OSH Act, the Secretary of Labor, Nuclear Regulatory Commission, and the courts have weighed in on what kind of reporting and to whom, constitutes protected activity.

In the years following the passage of the OSH Act, the Secretary promulgated regulations that broadly interpreted reporting under whistleblower provisions. For example, in 1977, the

Secretary expanded the range of persons or entities to whom a complaint could be delivered. Specifically, the rule stated, “The range of complaints ‘related to’ the Act is commensurate with the broad remedial purposes of this legislation and the sweeping scope of its application, which entails the full extent of the commerce power.”¹¹ The rule suggested that complaints could be made inside the worker’s own organization, as well as any federal, state or local entity authorized to regulate workplace health and safety.

The Secretary also took a broad view of the statutory language protecting a worker who “testified or is about to testify.” Through the rule-making process, the Secretary defined testimony as “any statements given in the course of judicial, quasi-judicial, and administrative proceedings, including inspections, investigations, and administrative rule making or adjudicative functions.”¹² The Secretary further clarified that testimony was protected in “any proceeding under or related to the Act.” Further, “This protection would of course not be limited to testimony in proceedings instituted or caused to be instituted by the employee.”¹³

In OSHA’s role as adjudicator of whistleblower claims, the Secretary also determined that an employee need not contact a government agency in order to be protected. In the case *Wedderspoon v. Milligan* (1980) the Secretary found that a worker’s contact with an environmental activist was protected activity because it “caused a proceeding.”¹⁴ The statutory language in ERA and whistleblower provisions in the six environmental laws do protect those who “cause a proceeding” or enforcement “action” and don’t specifically limit protection for those who contact a branch of government. In fact, Kohn and Carpenter argue that “the legislative history, NRC regulations, and statutory language all support the proposition that

¹¹ 29 C.F.R. § 1977.9(a)

¹² 29 C.F.R. § 1977.11 (1980)

¹³ *Id.*

¹⁴ 80-WPCA-1, slip op. of AU at 10-11 (July 11, 1980)], adopted by SOL (July 28, 1980).

protection of employees who contact non-government agencies or individuals concerning environmental concerns should be afforded protection” (Kohn and Carpenter 1986, 86)

This interpretation lowers the bar for workers to report concerns about possible violations of health, safety and environmental laws. Rather than requiring a worker to report to a member of Congress or a regulatory agency, the Secretary’s interpretation suggests a worker could instead report to a union official, local public interest group and even to the media. These individuals or organizations could then “cause a proceeding” by alerting elected or agency officials and raising public attention. This way of gaining attention to a concern may feel less intimidating to a worker, and also more likely to achieve the results they are seeking.

The Secretary’s interpretations have created a legally protected connection not just between insiders and government entities, but also between insiders and the media or public interest groups who participate in the NRC licensing process, or otherwise bring attention to potential violations of law. Citing a report by the public interest group, Union of Concerned Scientists, Kohn and Carpenter identify specific instances where “direct citizen activity has resulted in hundreds of significant improvements in nuclear safety” (1986, 88). In that sense, whistleblower protections have broadened the number of individuals and types of organizations that participate in ensuring compliance with laws that protect health, safety and the environment.

Reporting inside the organization

The original language in ERA and the OSH Act do not explicitly state that reporting internally – to management – is considered to be protected activity. However, the Secretary of Labor has interpreted the following provision to broadly interpret protected activity as, “assisted or participated or is about to assist or participate in any manner in such a proceeding or in any

other manner in such a proceeding or *in any other action* to carry out the purposes of this Act or the Atomic Energy Act of 1954, as amended. (42 U.S.C. 5851(a), emphasis added).

However, the Fifth Circuit Court of Appeals ruling in *Brown and Root v. Donovan* (1984),¹⁵ overturned precedent set by the Second, Ninth, and Tenth Circuits and the Supreme Court of the State of Illinois, which had followed the Secretary of Labor’s interpretation (Kohn and Carpenter 1986). Moreover, the Fifth Circuit’s ruling in *Brown and Root* contradicted precedence that internal reporting constitutes protected activity in cases brought under the Federal Mine Safety Act of 1969. These cases are also relevant because the whistleblower provisions in ERA were modeled after the Mine Safety Act.¹⁶ Until *Brown and Root*, the courts had consistently upheld internal reporting as a protected activity. For example, in the path-breaking case *Phillips v. Interior Board of Mine Operations Appeals* (1974), the D.C. Circuit Court of Appeals¹⁷ made it clear that reporting to a foreman was protected activity. In *Phillips* the court held:

“The Mine Safety Act protects miners who are discharged as a result of their complaints concerning safety violations in mines. Section 110(b)(1) prohibits discharge of or discrimination against a miner by reason of the fact that the miner (A) has notified the Secretary or his authorized representative of any alleged violation or danger, (B) has filed, instituted, or caused to be filed or instituted any proceeding under this chapter, or (C) has testified or is about to testify in any proceeding resulting from the administration or enforcement of the provisions of this chapter. *We believe that Phillips’ notification to*

¹⁵ 747 F.2d 1029 (1984)

¹⁶ 30 U.S.C. 820(b)

¹⁷ 500 F.2D 772 (D.C. CIR. 1974)

the foreman of possible dangers is an essential preliminary stage in both the notification to the Secretary (A) and the institution of proceedings (B), and consequently brings the protection of the Safety Act into play.” (emphasis added)

“... we look to: the overall remedial purpose of the statute (discussed under C. *infra*); the practicalities of the situation in which government, management, and miner operate; and particularly to the procedure implementing the statute actually in effect at the Kencar mine. The existence of this procedure in itself was a practical recognition that the bare words of the Safety Act, unless implemented by some procedure at the mine to bridge the gap between ‘the Secretary or his representative’ (presumably the Federal Bureau of Mines) and the coal miner himself (the object of the Act), would be completely ineffective in achieving mine safety.”

In these passages of the *Phillips* decision, the court made it clear that reporting concerns internally to a supervisor is considered protected activity that should not result in any form of retaliation. The court recognized the need to “bridge the gap” between an individual worker within an organization, and the regulatory agency tasked with overseeing the implementation of whistleblower protections, and more broadly, of safety. The following passage in *Phillips* acknowledged the ever-present tension between production goals and safe operations:

“Safety costs money. The temptation to minimize compliance with safety regulations and thus shave costs is always present. The miners are both the most interested in health and safety protection, and in the best position to observe the compliance or noncompliance with safety laws. Sporadic federal inspections can never be frequent or thorough enough to insure compliance. Miners who insist on health and safety rules being followed, even at the cost of slowing down production, are not likely to be popular with mine foreman or mine top management. Only if the miners are given a realistically effective channel of communication re health and safety, and protection from reprisal after making complaints, can the Mine Safety Act be effectively enforced.”

Taken together, these passages from *Phillips* recognize that workers who raise concerns are likely to be unpopular with their immediate supervisors, and perhaps even leadership at the highest levels of the organization. The court recognized the importance of workers in ensuring compliance with safety and health laws, acknowledging that inspections by regulators can never achieve the same level of compliance as can be achieved through insider knowledge and reporting. By asserting the need for effective communication channels within and outside the organization, the court increased obligations placed on organizations. Not only is it illegal to retaliate against workers, but the court also implied an obligation to establish internal processes for recognizing and resolving concerns that could be interpreted as protected activity.

A ruling in the 10th Circuit Court of Appeals helped to clarify that internal reporting is considered protected activity after *Brown and Root* called the matter into question. In *Kansas City Gas and Electric v. Brock* (1985).¹⁸ The court noted the legislative history of the Mine

¹⁸ 780 F.2d 1505, 1512 (10th Cir. 1985)

Safety and Health Act, which in 1977, had been amended to specifically protect workers who file internal complaints. Rejecting the 5th Circuit Court's holding in *Brown and Root*, the court held in *Kansas City Gas and Electric* that "Congress was advocating the protection of internal action and changed the statutory language not because its intent had changed, but because this intent had been incorrectly perceived by certain courts."

The Nuclear Regulatory Commission weighed in on the issue of internal reporting by filing an amicus brief in *Kansas City Gas and Electric*. The solicitor for the NRC wrote "NRC has encouraged its employees to inform licensee management initially of their safety concerns so that their concern can be resolved without the need for extensive NRC involvement."¹⁹ The NRC recognized its own limited capacity for responding to concerns and hoped to shift some of that responsibility down to its regulated entities.

But perhaps more importantly, the NRC sought to establish practices and processes for resolving safety concerns internally within its regulated entities. In a Notice to Employees to be posted in the workplace at nuclear sites, the NRC advised, "If you believe that violations of NRC rules or the terms of the license have occurred, you should report them *immediately to your supervisor*. If you believe that adequate corrective action is not being taken, you may report this to an NRC inspector or the nearest NRC Regional Office."²⁰

Here we see a regulatory agency urging the court to interpret whistleblower protection laws not simply as an anti-retaliation mechanism, but as a fundamental organizational responsibility to resolve concerns internally. Similarly, the Secretary of Labor persuaded the courts to interpret internal reporting as a protected activity under section 11(c) of the OSH Act.

¹⁹ Brief of the U.S. NRC as Amicus Curiae, *Kansas Gas & Electric Co. v. Brock*, 780 F.2d 1505 (10th Cir. 1985), CA 84-2114 filed March 1985, pp. 6-8.

²⁰ NRC Notice No. 50-413 and 414 (June 4, 1985), (emphasis added).

In 1977, the Secretary of Labor elected to take an 11(c) claim before a district court, arguing that an employee's complaint to his employer regarding a matter of occupational health and safety constituted protected activity.

In *Marshall v. Springville Poultry Farm*²¹ the Secretary argued that the “salutary principles of the [OSH] Act would be seriously undermined if employees were discouraged from lodging complaints about occupational safety and health matters with their employers.” The court agreed with the Secretary's argument and interpretation, which had been also codified into a formal rule.²²

In 2005, Congress passed the Energy Policy Act²³ which included provisions to specifically identify internal reporting as protected activity under Section 211 of the Energy Reorganization Act. On January 18, 2011, the Occupational Health and Safety Administration published a final rule that formally codified Congressional intent. While the statutory changes applied only to workers filing claims under ERA, OSHA's rule applied the change to the six environmental laws that contain whistleblower protections.

OSHA reasoned, “The changes to the regulations also affect the six environmental whistleblower statutes because the same procedures generally apply to each of the statutes covered in 29 CFR part 24. Because OSHA recognizes the importance of consistency in the procedures governing the whistleblower statutes that it administers, it has tried to standardize these regulations with other whistleblower regulations promulgated by OSHA to the extent possible within the bounds of the statutory language” (Occupational Safety and Health Administration January 18, 2011).

²¹ 445 F.Supp. 2

²² 29 C.F.R. § 1977.9(c)

²³ P.L. 109-58

Again, the rule promulgated by the Secretary of Labor suggests that the administrative agency, through its rule-making and adjudication powers, has played an important role in broadening the reach and impact of whistleblower protections. At the same time, it could be said that this very broadening of the law's reach has ultimately challenged OSHA's capacity to investigate and decide the merits of claims of retaliation that come before it (Worthen 1984). Even as the agency's rule-making and actions in some ways strengthened whistleblower protections, it could be said that its shortcomings as an adjudicator have significantly weakened those protections.

Private right of action

The case *Taylor v. Brighton Corp.* (1980)²⁴ clarified the matter of whether an employee filing a claim of retaliation under section 11(c) of the OSH Act was afforded private right of action. In other words, whether the employee could bring a case in court or was limited to an administrative adjudication by OSHA. As noted above, Congress debated this issue and came to agreement during conference proceedings on the final legislation. In its decision in *Taylor*, the Sixth Circuit Court of Appeals cited the legislative history of the Act, and argued that Congress clearly intended suits brought by the Secretary of Labor to be the "exclusive means of redressing violations."

Of note is the amicus brief filed by the Secretary of Labor in *Taylor*. The court's decision summarized the brief as follows, "The Secretary of Labor filed an amicus brief urging this court to find an implied private right of action under § 11(c). The Secretary says he has neither the resources nor the personnel to handle all § 11(c) complaints adequately. Moreover, he expects

²⁴ 616 F.2d 256 (1980)

the number of such complaints to increase dramatically due to his current campaign to alert employees of their OSHA rights. A private right of action should be implied, the Secretary argues, because individual suits offer the only realistic hope of protecting employees from retaliatory discrimination.”

Out of concern for the Agency’s capacity to adjudicate claims, the Secretary promulgated a 1980 rule suggesting that bringing action in court was discretionary, not mandatory. The rule stated, “if . . . the Secretary determines that the provisions of section 11(c) have been violated, civil action may be instituted. In *Taylor*, the court commented on the Secretary’s position and this recently established rule. The court noted, “If he finds merit in the complaint, ‘the Secretary . . . shall bring an action’ in the district court to obtain all appropriate relief (emphasis added).”

The Secretary’s concerns about OSHA’s capacity to resolve claims were not without merit. Between 1974 and 1977, claims under 11(c) roughly tripled from 700 to 2,226 (Worthen 1984, 928). In response to the Secretary’s concerns about capacity, the court in *Taylor* responded, “The Secretary should address his arguments to Congress, not the courts.”

The rule-making, amicus brief filed in the *Taylor* case, and court rulings send mixed messages to workers who might consider filing a claim. On one hand, the Secretary recognizes that the only way to fulfill the promise of protecting workers from retaliation is through bringing the case in court. At the same time, the Secretary has argued for discretion in determining whether to bring a meritorious claim before the courts. The legislative history of the OSH Act suggests that Congress intended for the Secretary to have broad powers of discretion for determining whether a claim should be brought in court. Yet the conflict between the legislative history and holdings in cases like *Taylor* mean that an employee may have a difficult time compelling the Secretary to bring a claim in court on his or her behalf.

Claims resolution capacity

While in many ways, OSHA and the NRC could be said to have expanded the meaning and interpretation of whistleblower protections, although OSHA's adjudication process has weakened those protections because of the agency's capacity to make a determination on claims. As OSHA has struggled to manage its claims adjudication process, Congress has continued to include whistleblower provisions in increasingly complex laws such as Sarbanes Oxley, the Aviation Investment and Reform Act, and the Dodd-Frank Act. The sheer number and complexity of these new laws have continued to challenge OSHA's capacity to thoroughly, fairly, and efficiently adjudicate claims.

In the past 25 years, OSHA's whistleblower protection program has been evaluated in 1989, 1997, 2001 and 2010 by the Department of Labor Inspector General (IG), and in 1988, 2009, and 2010 by the Government Accountability Office. In 2010, OSHA published a report detailing a "top to bottom" review of its own program, including recommendations for improvement (Department of Labor December 2010). As far back as 1988 and again in 2001, the IG reports acknowledged that OSHA lacked a centralized and efficient system for managing information, and exceeded statutory timeframes for completing investigations. Statutory language specifies that OSHA must complete its investigation and issue its initial decision and order in 90 days for OSH claims, and 30 days for ERA claims. In reality, those filing claims generally wait two to three years for this initial decision, and some wait as long as six years (Devine and Maassarani 2008).

In 2009, the GAO determined that they could not accurately determine case processing times or outcomes due to deficiencies in OSHA's databases. The same report found that investigators lacked training, and basic resources such as laptops and portable printers needed to conduct investigations. Perhaps most worrisome, the GAO found that among the 10 different regions, inconsistent standards were applied to screen out cases.

The GAO concluded its 2009 report with the following statement. “Twenty years ago, we found that OSHA lacked adequate internal controls to ensure that criteria and standards for investigating whistleblower complaints were consistently followed. Since then, little has been done to ensure that OSHA-and ARB-have the accurate and complete data they need to manage and oversee the program. No effort has been made to validate the accuracy or the timeliness of the data. Having such data is a necessary first step in determining whether the program is meeting required statutory and regulatory time frames for responding to whistleblowers’ complaints, and, if it is not, in assessing the reasonableness of those time frames. Furthermore, because many complaints are screened out and never recorded in OSHA’s database, it has an incomplete picture of how many complaints it receives and of their ultimate outcomes, and it cannot ensure that screen-out decisions are made using consistent criteria” (Government Accountability Office 2009, 40).

The GAO’s report in 2010 was not gentler in its conclusions. The report again stated, “For over 20 years, we have repeatedly found that OSHA lacks sufficient internal controls to ensure that standards for investigating whistleblower complaints are consistently followed. Little progress has been made in implementing our recommendations and significant internal control problems remain.” Without significant improvements in internal controls and consistent methodology,” the GAO warned, “whistleblowers will continue to have little assurance that a complaint filed in one region would have the same outcome if it were filed in another” (Government Accountability Office 2010, 39). While the GAO acknowledged OSHA’s efforts in conducting the “top to bottom review” it also noted that OSHA already had “much of the information it needs to move forward.” The GAO admonished that the problems they had identified “appear systemic and sustained management attention is needed to address them” (Government Accountability Office 2010, 38).

In an informal meeting with stakeholders, Assistant Secretary for OSHA, David Michaels heard about the practical impacts of OSHA's resolution process.²⁵ Of greatest concern, is the time it takes for OSHA to conduct its initial investigation. Particularly for a project with a finite beginning and ending, such as construction of a pipeline, a determination by OSHA may be made long after the project is complete. This delay gives companies little incentive not to transfer or fire a worker who is raising concerns that may be considered protected activity, but which also put goals for production and profit at risk.

Another weakness is that OSHA does not normally contact the regulatory agency that oversees the underlying activity that originally caused the worker to report a concern. The one exception to this is the Nuclear Regulatory Commission, which in 1982 signed Memorandum of Understanding with OSHA that it be notified when a worker files a claim of retaliation for engaging in protected activity. The NRC then undertakes its own investigation about an alleged violation of nuclear safety. If appropriate, the NRC can take enforcement action, including a Notice of Violation, without waiting for OSHA to conclude its investigation and determine an appropriate remedy, if any, for the employee.²⁶

As members at this December 2011 informal meeting discussed, OSHA should rely on other regulatory agencies to conduct an investigation and take appropriate enforcement action if a violation of an environmental, transportation, consumer safety, or financial regulation is found. This is important for two reasons. First, the threat of enforcement action resulting from a claim of retaliation may prompt a company to work with an employee to address and resolve the concern. Second, and perhaps most importantly, workers are most likely to report misconduct or

²⁵ Notes from the meeting which I attended in Washington D.C. on December 7, 2011.

²⁶ The MOU was revised in 1998 in response to the Energy Policy Act of 1992, and clarified that the NRC will turn over the results of its investigation to OSHA.

violations of law to an oversight agency if doing so will result in an investigation. If OSHA continues to be a place that results in no meaningful or timely action, workers are more likely to remain silent.

In fact, most workers do stay silent (see Devine and Maassarani 2008; Miethel 1999; Morrison and Milliken 2000). While many have pointed to the weaknesses in the OSHA adjudication process, others have pointed to weaknesses in the laws themselves. Some suggest that the anti-retaliation model of whistleblower protections, such as the OSH Act and ERA, have failed to encourage workers to report concerns, or to protect those who do. As some critics have noted, “Indeed, the approach has been spectacularly unsuccessful in protecting whistleblowers” (Dworkin and Brown 2013, 657). Yet, changes to the legal model of protection and offering a right of private action don’t appear to have achieved better outcomes in terms of protecting whistleblowers. The data and analysis presented in the following section suggests that the strength of the law protecting a worker is less influential in determining an outcome than regulatory oversight or the type of industry in which a worker is employed.

Trends in the number of claims filed with OSHA

Under the OSH Act of 1970, the Department of Labor’s OSHA was tasked with adjudicating claims of retaliation for reporting concerns. As described earlier, OSHA was also assigned the task of adjudicating retaliation claims under 21 different statutes. In many cases, OSHA otherwise has no regulatory authority for enforcing the law containing whistleblower protection provisions.

More specifically, the laws that include whistleblower protection provisions can be categorized generally as those regulating the environment, worker and nuclear safety, air and

ground transportation, fraud prevention, and consumer safety. Although each of the 21 laws contains whistleblower protection provisions, the overall activities of organizations subject to these laws are regulated by a number of different agencies.

For example, six environmental laws are enforced by the Environmental Protection Agency, while nuclear safety under the Energy Reorganization Act is enforced by the Department of Energy and the Nuclear Regulatory Commission. Laws related to safe transportation are implemented by a number of agencies within the Departments of Homeland Security and Transportation. Regulations in Sarbanes Oxley and some provisions in Dodd Frank are overseen by the Securities Exchange Commission.

Regulatory agencies may be one of the first places a concerned worker reports outside of his or her organization. As others have noted, “there is clear evidence that agencies that take their responsibilities to whistleblowers seriously – and many do – achieve better outcomes in the management of whistleblowing than agencies that do not” (Dworkin and Brown 2013, 694). Whistleblower attorneys and advocates interviewed for this study suggest that the response a worker receives upon approaching a regulatory agency with a concern can send important signals back into the workplace. For example, if the agency treats workers with respect and consistently investigates concerns, workers will come to see the agency as a place where their concerns can be resolved and change will occur. In that way, regulatory agencies play an influential role in shaping perceptions of workers who might engage the law within a given industry and individual organizations.

The following table shows the number of formal whistleblower claims filed, and the statute under which it was filed for the years 2005 through 2011.

Table 2.2: Formal claims filed with the Department of Labor 200502011

	Cases filed						
Worker and Nuclear Safety Laws	2005	2006	2007	2008	2009	2010	2011
Asbestos Hazard Emergency Response Act of 1986 (AHERA)	2	0	1	1	6	6	2
Energy Reorganization Act of 1974 (ERA)	52	53	23	41	46	50	48
Occupational Safety and Health Act of 1970 (OSHA)	1,194	1,195	1,301	1,381	1,270	1,418	1,656
<i>Total Worker and Nuclear Safety</i>	<i>1,248</i>	<i>1,248</i>	<i>1,325</i>	<i>1,423</i>	<i>1,322</i>	<i>1,474</i>	<i>1,706</i>
Transportation and Industry Laws							
Transportation and Industry Laws	2005	2006	2007	2008	2009	2010	2011
Federal Railroad Safety Act of 1970 (FRSA)	0	0	1	45	144	196	331
International Safe Container Act of 1977 (ISCA)	0	0	0	0	0	1	0
National Transit Systems Security Act of 2007 (NTSSA)	0	0	0	18	15	14	15
Pipeline Safety Improvement Act of 2002 (PSIA)	3	7	1	3	3	2	5
Seaman's Protection Act of 2010 (SPA)	0	0	0	0	0	0	5
Surface Transportation Assistance Act of 1982 (STAA)	271	241	297	357	305	305	308
Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (2000) (AIR21)	65	52	50	85	91	74	62
<i>Total Transportation and Industry</i>	<i>339</i>	<i>300</i>	<i>349</i>	<i>508</i>	<i>558</i>	<i>592</i>	<i>726</i>
Fraud Prevention Laws							
Fraud Prevention Laws	2005	2006	2007	2008	2009	2010	2011
Affordable Care Act of 2010 (ACA)	0	0	0	0	0	4	14
Consumer Financial Protection Act of 2010 (Section 1057 of the Dodd-Frank Act) (CFPA)	0	0	0	0	0		5
Sarbanes-Oxley Act of 2002 (SOX)	291	234	231	235	228	198	136
<i>Total Fraud Prevention</i>	<i>291</i>	<i>234</i>	<i>231</i>	<i>235</i>	<i>228</i>	<i>202</i>	<i>155</i>

<u>Environmental Laws</u>	2005	2006	2007	2008	2009	2010	2011
Clean Air Act of 1977 (CAA)							
Comprehensive Environmental Response, Compensation and Liability of 1980 (CERCLA)							
Federal Water Pollution Control Act of 1972 (aka the Clean Water Act) (FWPSCA)							
Safe Drinking Water Act of 1974 (SDWA)							
Solid Waste Disposal Act of 1976 (aka the Resource Conservation and Recovery Act) (SWDA)							
Toxic Substances Control Act of 1976 (TSCA)							
<i>Total Environmental</i>	<i>56</i>	<i>60</i>	<i>61</i>	<i>51</i>	<i>46</i>	<i>45</i>	<i>42</i>
<u>Consumer Safety Laws</u>							
Consumer Product Safety Improvement Act of 2008 (CPSIA)	0	0	0	2	4	6	2
FDA Food Safety Modernization Act of 2010 (FSMA)	0	0	0	0	0	0	17
<i>Total Consumer Protection Safety</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>2</i>	<i>4</i>	<i>6</i>	<i>19</i>
<i>Total All Claims</i>	<i>1,934</i>	<i>1,842</i>	<i>1,966</i>	<i>2,219</i>	<i>2,158</i>	<i>2,319</i>	<i>2,648</i>

Source: Freedom of Information Act Request to the Department of Labor filed by author and fulfilled April 11, 2012.

A number of observations can be made about these data, although no conclusions can be drawn about causality based on this table alone. First, the total claims filed under the six environmental laws appear to be relatively low considering that these figures include six laws and regulate the environmental activities of every business, state, and local government. This may be an indication that the Environmental Protection Agency (EPA) takes seriously concerns

reported to the agency, which has the authority to levy civil and criminal penalties against organizations violating laws may cause regulated entities to take concerns seriously if they are reported to management by a worker.

Second, claims filed under the Occupational Safety and Health Act clearly comprise the majority of claims. This may be due to weaknesses in the whistleblower protections outlined in section 11(c) of the Act, and the absence of any other right of action under that statute. On the other hand, the OSH Act may be the most comprehensive statute in terms of the number of workers covered by it. Every workplace in the U.S. is regulated by OSHA or a designated state agency, so evaluating the number of claims as a percentage of the workforce may reveal that reprisals related to a worker reporting concerns about health and safety are lower than they appear. So, it may suggest that OSHA and its designated state agencies don't have a system in place for investigating concerns reported to it, or its regulatory approach isn't sufficient to bring about compliance among regulated organizations.

Third, there appear to be a relatively high number of claims under the Federal Railroad Safety Act. An analysis of these claims as a percentage of the workforce covered by FRSA may reveal that the incidence of reprisals in the railroad industry is very high relative to other industries. The FRSA is regarded as having relatively strong whistleblower provisions in terms of worker protection, so the high number of claims comes as a bit of a surprise. It suggests that something other than the strength of the law is at play. Perhaps the Federal Railroad Administration is not responsive to concerns brought to it by workers, or is not stringently enforcing aspects of the laws regulating railroad operations, which in turn is causing workers to be concerned. While these data are not conclusive, they certainly suggest that the influence of a regulatory agency or industry is causing variation in the number of claims filed.

Fourth, there are three laws that grant a right of private action, or the right to take a claim of retaliation to court. These laws include protections in Sarbanes Oxley (2002), ERA (amendments in 2005), Surface Transportation Assistance Act (amendments in 2008), and Consumer Product Safety Improvement Act (2008). The data above show very high numbers of claims under Sarbanes Oxley and the Surface Transportation Assistance Act, when we might expect low numbers if the strength of the law is a key factor in determining organization's compliance with whistleblower protections. It could be argued that the strength of the law is encouraging workers to raise concerns, thus increasing the opportunity for retaliation.

On the other hand, these high numbers of claims may suggest something unique about the financial services and surface transportation industries. Perhaps the companies engaged in these activities have determined that the potential losses that might result from public revelations of misconduct or wrongdoing are higher than the costs of illegally retaliating or firing a worker or manager who is raising concerns. It may also suggest weak enforcement of the underlying laws by the Securities and Exchange Commission or the Department of Transportation, and little coordination between these agencies and OSHA.

Fifth, the outcomes of claims filed under Sarbanes Oxley and ERA, two laws considered to be strong in terms of worker protections, have been dismissed at a higher rate than average by OSHA. The GAO investigated the outcome of claims adjudicated by OSHA in 2007. Of the 1,238 claims analyzed, a mere 19% were found by OSHA to have merit, but of the 20 claims filed under ERA, only 12% were found to have merit. At the same time, of the 183 claims filed under the Surface Transportation Assistance Act, 22% were found to have merit (Government Accountability Office 2009, 26). Again, we are seeing variation in the outcomes of claims that are not correlated with the strength of the underlying law.

Conclusion: Statutory language is not a strong predictor of the strength of legal protections in practice

It makes sense to look to the strength of the underlying whistleblower protections, and to the adjudication process to try and determine the efficacy of these laws. Yet the kind of variation described above calls this method of analysis into question. The approach used in this study also relies on an analysis of the laws themselves and the processes for adjudicating them. However, I consider these factors to be among the many factors that come to bear on organizations that determine individual decisions and action.

In addition to the text of law and forums for claims adjudication, this study also examines the influence of the regulatory agencies overseeing the activities of organizations engaged in such activities as nuclear energy production, superfund cleanup, financial services, or transportation. Further, this study digs deeply into the history of the organizations and established bureaucratic processes (or programs and routines) that comprise their cultures to understand the context into which whistleblower protections are introduced. In other words, the chapters that follow examine the layers of influence that flow down from statutory law and court rulings, and regulatory interpretations. These factors then remake law into legal practice when they are refracted through organizational norms, heuristics, biases, and decision processes.

I begin by painting a picture of the historical context of the emergence of nuclear technology, and the changes in political, societal and media attention to the issue over time. Next, I show how these factors have influenced the approaches taken by the two agencies that oversee nuclear activities at Hanford. The discussion then links these factors in the external environment to the organizations at Hanford, showing how whistleblower protection laws and

external pressures are filtered through their unique cultures to shape their responses. Finally, I analyze the results of interviews with individual workers, managers, union representatives, regulators, and public interest advocates at the site. These individual perspectives serve as a window into the organizations that operate there, deepening our understanding of the role organizations play in determining the reach and impact of law.

Chapter Three

A HISTORY OF SECRECY, INNOVATION, AND RISK

“Secrecy had been clamped on the entire project. Secrecy with an iron hand.”
Hill Williams, author of *Made In Hanford*

The smell of freshly mown alfalfa and pungent sage are a hallmark of early summer mornings on the desert steppe of southeastern Washington State. The indigo hues of the Columbia River and calls of California quail offer little evidence of the substantial releases of radioactive material into the air and water in prior decades, or of the 56 million gallons of radioactive waste stored in leaking underground tanks at the Hanford site.²⁷ Despite the surrounding natural beauty, the site is the most contaminated nuclear site in America and the Western Hemisphere.²⁸ The challenges facing the site today are deeply rooted not just in the actual contamination, but also the historical, societal and political influences infused within the organizations tasked with ongoing operations and cleanup.

The notion that these external factors influence internal culture and decision-making within organizations is not new. Others have conceptualized organizations not just as a “closed” a system, with an internal focus on planning and control, but as a “natural” system that is open to variables and influences within its broader environment (see Gouldner 1959; Thompson 1967,

²⁷ The Department of Ecology’s website states that of the 177 waste tanks at the Hanford Site, seven are currently leaking. In the past, a total of 67 tanks have leaked an approximate one million gallons of high level waste. See http://www.ecy.wa.gov/programs/nwp/sections/tankwaste/closure/pages/tank_leak_FAQ.html accessed December 1, 2014.

²⁸ The Hanford Nuclear Site is considered by many public interest groups to be the most contaminated nuclear site in the Western Hemisphere. These groups include Physicians for Social Responsibility, the Government Accountability Project, Columbia Riverkeeper, and Hanford Challenge. See for example: <http://www.psr.org/chapters/washington/hanford/hanford-facts.html> accessed December 1, 2014.

2010). In other words, an organization conceived as a natural system is not merely an autonomous entity, but subject to the influence of “other complex organizations and publics on whom the organization is dependent” (Thompson 1967, 2010, 7).

This chapter examines how the social, political and regulatory environment has shaped the culture of organizations operating at Hanford over time. As Edgar Schein notes, “... if one can demonstrate that a given set of people have shared a significant number of important experiences in solving external and internal problems, one can assume that such common experiences have led them, over time, to a shared view of the world around them and their place in it” (1985, 7). Although the role of government organizations and private contractors operating the site have evolved from weapons production to energy production and environmental cleanup and restoration, deeply rooted traditions and methods of problem solving that emerged in the early days of the atomic age remain evident today.

This chapter looks back in time, showing how the organizations conducting activities at the site today have been shaped by the site’s history, changing social expectations and political and media attention over time. The narrative presented in this chapter suggests that these less tangible but nonetheless influential contextual factors come to bear on organizations. Tracing changes in these factors over time, this chapter sets the stage for understanding how context has shaped organizational responses to whistleblower protection laws today.

Secrecy and the emergence of the atomic age

The effort to acquire the first atomic weapon during World War II was shrouded in secrecy. Neither the owners of the 430,000 acres of land appropriated by the U.S. Army Corps of Engineers (including the small agrarian towns of Hanford and White Bluffs), nor the 137,000

workers who constructed the site knew what they were building (See Gerber 2007, 33, 45; Sanger 1995, 68). The project's aim was known only by a handful of scientists and engineers who believed they were in a race to develop an atomic weapon that would alter the outcome of World War II and the change course of history (See for example Conant 2006; Szilard 1978).

In a 1939 letter to Franklin D. Roosevelt, Albert Einstein described the work of colleagues who had also fled Nazi Germany and Italy, suggesting that Germany had taken measures to stop the sale of uranium and may be pursuing an atomic weapon. Einstein's letter promoted the formation of the "S-I Executive Committee" comprised of an elite group of scientists conducting work at Princeton, Columbia and Berkeley.²⁹ The scientists would work under the direction of Arthur Compton at the Metallurgical Lab (Met Lab) at the University of Chicago.

Compton was charged with the development of plutonium and weapons theory. The group of scientists accelerated their efforts under Compton's direction and kept their findings closely held during the war (For a summary of the formation and work of this committee, see Williams 1991, 61-67). Their efforts led to the development of the "Manhattan Project" beginning in 1942 - a secret military effort to build an atomic weapon - authorized by the president and undertaken by the Army Corps of Engineers. Hanford would become one of a handful of sites engaged in this top-secret effort.

In February 1943, Lt. Col. Franklin Matthias visited the editors of local papers in the Tri-Cities area of southeastern Washington State. He informed them of a major project starting up nearby and of its importance to the war effort and of secrecy. The editors, although surely curious, agreed not to publish stories related to the project (See Findlay and Hevly 2011, 36;

²⁹ I obtained a copy of Einstein's letter to Roosevelt following a tour of the Hanford Site. A copy of the letter can be obtained by contacting Manhattan Project B Reactor Tour Headquarters 2000 Logston Boulevard, Richland, WA 99354 and (509) 376-1647.

Williams 2011, 3-8). On June 28, 1943 a newly established Office of Censorship contacted 2,000 daily papers, 11,000 weeklies, and all the nation's radio stations, informing them of a Code of Wartime Practices. The Office of Censorship requested "that nothing be published about a list of topics, actually mentioning atom-splitting atomic fission, radioactive materials, and new and exotic weapons" (Williams 2011, 87).

The effort at Hanford was kept secret even from members of Congress, with funding buried in the budget for the Army Corps of Engineers and inquires by members of Congress rebuffed by project leaders. In 1944, Congressman Compton White of Idaho arrived unannounced at the Hanford site's Yakima gate, demanding an explanation of the project. Prompted by concerns constituents raised about agricultural land taken out of production, he wanted to know what kind of project could possibly justify such action by the government? In response to his demands for information, Congressman White was detained in a windowless room and questioned for four hours under bright lights until he was released (See Williams 2011, 83-85).

The project had also been investigated by a committee established by then Senator Harry S. Truman. The inquiry into the project ended at the request of Lt. Col. Matthias, citing its contribution to the war effort and the importance of secrecy. In fact, Truman never learned the details of the effort at Hanford until after the death of Franklin D. Roosevelt when he assumed the presidency (See Gerber 2007, 45; Williams 2011, 83). Shortly thereafter, he was tasked with the weighty decision about whether to drop nuclear weapons on Japan to end the war. It is difficult to imagine the media showing such restraint, or members of Congress ceding their oversight role and deferring to the judgment of the executive branch in contemporary times.

Yet secrecy was synonymous with security at Hanford and throughout the emerging nuclear weapons complex. From the beginning, those working at the Hanford site were even denied access to information related to their own jobs, and few workers knew what they were building or producing until the bombs were dropped on Hiroshima and Nagasaki.³⁰ As the chief photographer during construction of the Hanford reactors, Robley Johnson recalled, “I remember taking a picture one day and the next day I couldn’t see it without a special pass. I’d printed and delivered it the day before and now I couldn’t see it. And every time I turned around someone would see the camera and grab me. Sometimes they’d hold me for an hour until they found out by telephone who I was” (Williams 2011, 90).

Construction worker Bill Bailey described the processes in place to ensure that no worker or group of workers had full knowledge of what they were building. For example, he said that electricians, pipefitters and millwrights may only be authorized to work on one side of a reactor. Only one person could see the entire blueprint for the reactor. If a foreman or superintendent had a question, he would go to the person with the blueprint, who would provide him with a pencil sketch of the area in question. Bailey said simply, ““You didn’t talk about it. I hear a guy ask about a certain object he was working on, and a fella told him, you ask that question one more time and you’ll go” (Sanger 1995, 137).

The effort to construct the first reactor is an impressive technical accomplishment. Standing at the base of B Reactor, the first reactor constructed at Hanford, is nothing short of

³⁰ See accounts of workers and their reflections on learning that they had created an atomic bomb in Sanger (1995). Members of Congress, the Joint Chiefs of Staff and the State Department were not informed of the development of the bomb until February 1945. The first bomb was tested in July 1945, and dropped on Nagasaki on August 9, 1945 (See Gerber, 2007: 45).

awesome.³¹ The reactor is five stories tall and during its years of operation, the reactor held 2,004 finely milled tubes containing uranium along with “control rods” which were inserted or removed to control a nuclear reaction. B Reactor was completed in only 15 months and was 500 million times as powerful as the prototype developed at the University of Chicago’s Met Lab (Findlay and Hevly 2011, 17). The reactor began operating less than two years after the first chain reaction was sustained at the Met Lab’s prototype (Williams 2011, 97). The fact that it started up with minimal difficulties and operated without a catastrophic accident is a testament to the scientists and engineers who constructed and operated the reactor.

The construction and operation of B reactor was completed by a private contractor, and reliance on contractors was to become a tradition at the Hanford site. As a contractor to the Army Corps, DuPont was well suited to complete this work. With expertise in both chemicals and munitions and a reputation for building its own plants, it had the expertise necessary to run a first-of-a-kind plant. Equally important was its expertise in chemical processing, for separating out plutonium-239 from the spent nuclear fuel required an extensive process that generated significant amounts of waste for every gram of plutonium produced.

Colonel Matthias pushed DuPont to perform the task of constructing and operating the first reactor, and after a guarantee of complete indemnification, DuPont agreed (Gerber 2007, 25). However, the Army and Met Lab scientists at times questioned the choice of DuPont as the contractor. Both General Groves and Colonel Matthias pushed DuPont to go faster in an effort to produce the first weapons-grade material and bring an end to the war (See Findlay and Hevly 2011, 23-25). The Met Lab scientists were “even more critical, complaining that the contractor

³¹ I had the opportunity to take a tour of the Hanford Site and B Reactor on April 10, 2012. A limited number of tours are available to members of the public and can be scheduled at the following website: <http://manhattanprojectbreactor.hanford.gov>

was too ‘conservative’, too slow, too obsessed with safety” (Findlay and Hevly 2011, 24). At the same time, designs for the first reactor drafted by the Met Lab were changed routinely, requiring DuPont in many cases to tear apart and redo work that had already been done. These challenges coordinating scientists and engineers, labs and contractors on a first-of-a-kind project would continue to challenge leaders at the site some sixty years later.

Manhattan Project leaders decided to construct two reactors simultaneously, in case the first one failed to operate as planned. Matthias described Hanford’s goals in the following terms: ‘Our first requirement is the early production of some material, and...our second requirement is a large quantity of material’” (Findlay and Hevly 2011, 25). The need for production overshadowed consideration of the short or long term consequences for worker health and safety, or for the environment. For example, in 1943, Matthias instructed DuPont to omit installation of a water treatment system on the second reactor in order to shorten the time to completion (Findlay and Hevly 2011, 25). By the fall of 1944, U.S. intelligence revealed that the Germans were not close to developing atomic weapon, yet Manhattan Project leaders felt only increased urgency to test and deploy an atomic weapon against Japan before the war came to an end (See Findlay and Hevly 2011, 24).

Throughout its history, the Hanford site has been characterized by a tension between production and safety, scientists and engineers, government agencies and contractors. Although DuPont depended on researchers and scientists at the Met Lab, they accepted full responsibility for the design and safety of the reactor and later of the chemical processing plants that extracted plutonium from the irradiated uranium fuel (See Williams 2011, 78). During these years, it was the private contractor and not the government that pushed for safety programs. In 1944, when B Reactor was nearly complete, DuPont urged project managers to conduct evacuation drills.

According to Hill Williams, “DuPont headquarters in Wilmington, Delaware, was pressing for a practice evacuation in case of an emergency after the plants began operation” (Williams 2011, 105). General Groves opposed a drill saying “any practice evacuation of the Hanford Camp would cause a complete breakdown in the security of the project” (Advisory Committee on Human Radiation Experiments 1995, 323). Matthias noted in his diary, it could be “disastrous to the project as it might cause a large number of people to leave if their fears of safety were increased” (Williams 2011, 105). After some negotiation, plans to evacuate workers all the way to the city of Richland were modified to practice a quick exit of those working inside B and D reactors. DuPont continued to advocate for more extensive drills but they were never conducted” (Williams 2011, 105).

Losing workers during the war was a real concern to Manhattan Project directors. During the years of construction during World War II, the Army had to compete with other branches of the military and industry to recruit workers, and turnover at the site had been high. In fact, the exodus of workers was so concerning that the army and DuPont began conducting exit interviews to determine why workers were leaving. Despite their efforts to provide entertainment and a good quality of life, there were many reasons why workers left and neither the Army nor DuPont could resolve every concern (See Findlay and Hevly 2011, 25-26). “One complaint from some departing workers, which stemmed from the secrecy of the Manhattan Project, was that they felt they were not making a substantial contribution to the war effort (Findlay and Hevly 2011, 25).

Dissent within the Manhattan Project: responses by organizational leadership

During the late summer of 1944, Met Lab scientists became concerned that even though B reactor was nearly complete, they may not be able to devise a way to detonate plutonium, making it difficult to weaponize the material. Colonel Kenneth Nichols noted this concern in his journal after a meeting with Met Lab scientists. Nichols wrote that had it not been for the secrecy of the project, Congress certainly would have killed it. Charges that the plutonium bomb was impossible, he said, would have been “hard to disprove as our troubles continued during the third quarter of 1944” (Williams 2011, 127).

At Hanford, the B Reactor “went critical” on September 20, 1944. On February 3, 1945, Lt. Colonel Matthias, accompanied by a security guard, left the site with a small wooden box under his arm. Inside the small box and cradled in insulation, was a stainless steel flask containing three and a half ounces of Hanford plutonium. This small box represented an investment of hundreds of thousands of acres, hundreds of millions of dollars of material, equipment and fees, and the labor of tens of thousands of workers. Matthias and the security guard placed the box in a car and drove down the Columbia River gorge to Portland, Oregon where Matthias boarded a passenger train bound for Los Angeles. There he handed the box to an army officer who boarded an eastbound train. At the laboratory in Los Alamos, New Mexico, the plutonium would ultimately be assembled into the bomb that would be dropped on Nagasaki, Japan (Williams 2011, 125-126).

Not long after plutonium made its way to Los Alamos, word came back to the Met Lab that scientists at the Los Alamos lab were close to weaponizing the material. Some Met Lab scientists began to discuss their concerns in earnest about the apparent imminent use of an atomic weapon. They believed they had been in a race with Germany to develop the bomb, but

by the spring of 1945, the Germans had been badly beaten in the Battle of the Bulge and their defeat seemed all but inevitable. In May of 1945, Germany surrendered. Scientists at the Met Lab began recording their concerns on paper, urging the War Department and President Truman to exercise restraint in using the deadly new weapon they had helped to create.

Seven members of the Met Lab, headed by James Franck, the director of the lab's chemistry division, formalized their concerns in the "Franck Report" (Franck et al. June 11, 1945). Their concerns were moral as well as strategic. They first outlined the potential consequences of using the weapon and alerting the rest of the world to its existence. The authors began by noting that their expertise as scientists did now allow them to speak with authority on matters of policy. However, they said they had found themselves "by the force of events...in the position of a small group of citizens cognizant of grave danger for the safety of this country as well as for the future of all the other nations, of which the rest of mankind is unaware" (Franck et al., 1).

The scientists presumed that a nuclear armaments race was all but inevitable - that neither secrecy nor the control over nuclear materials could prevent it - and urged delaying the introduction of nuclear weapons so that the U.S. could "...increase our headstart still further." They warned that introducing a nuclear weapon by bombing Japan could harm future chances for international agreements against using such weapons. "Thus," they said, "from an optimistic point of view - looking forward to an international agreement on prevention of nuclear warfare - the military advantages and the saving of American lives, achieved by the sudden use of atomic bombs against Japan, may be outweighed by the ensuring loss of confidence and wave of horror and repulsion, sweeping over the rest of the world, and perhaps dividing even the public opinion at home" (Franck et al. June 11, 1945, 4).

The signors intended their letter for the “Interim Committee” established just a few weeks prior on May 4, 1945. Headed by Secretary of War Henry Stimson, the committee would determine what to do with a nuclear weapon once it was available. The Interim Committee was advised by a Scientific Panel consisting of four physicists including Arthur Compton (head of the Chicago Met Lab) and J. Robert Oppenheimer (director of the Los Alamos laboratory).

On July 16, 1945, the first plutonium bomb was tested in the desert of New Mexico. This heightened the concerns of Met Lab scientists including Leo Szilard, who had signed the Franck Report. He believed that the moral reasons against using the bomb had been underemphasized in the Franck Report. On the day following the test explosion of the first atomic weapon, Szilard circulated a petition that would come to be known as the Szilard Petition (Szilard July 17, 1945).

The petition was addressed to the President of the United States and began by explaining that until very recently scientists working on an atomic weapon feared that Germany would develop and use such a bomb against the United States during the war. Szilard stated that with the defeat of Germany “this fear is averted and we feel compelled to say the following: The war has to be brought speedily to a successful conclusion and attacks by atomic bombs may very well be an effective method of warfare. We feel, however, that such attacks on Japan could not be justified, at least not unless the terms which will be imposed after the war on Japan were made public in detail and Japan were given an opportunity to surrender.” The advent of atomic weapons required a “solemn responsibility” to lead the world in its use, argued Szilard, and required an “obligation of restraint.” The short petition concluded that “if we were to violate this obligation our moral position would be weakened in the eyes of the world and in our own eyes” (Szilard July 17, 1945).

Met Lab scientist Eugene Wigner took the petition to the lab at Oak Ridge, Tennessee, where it was circulated among scientists there. According to one account, when military officials learned of the petition, they “bawled out” Wigner and put a halt to its circulation on the grounds that it hinted at the readiness of the bomb and was a violation of security (Wyden 1984). Another original version of the petition circulated at Los Alamos and there are differing accounts about how leaders there reacted. One account suggests that lab director Robert Oppenheimer demanded that it not be circulated, while others suggest that Oppenheimer merely discouraged it (See for example Gest 2001; Wyden 1984). One thing was clear – project leaders at all levels across the complex sought to contain the concerns that scientists wanted to express to the president.

The petition ultimately gathered sixty-nine signatures on nine pages. Szilard wanted to deliver the petitions to the president personally, but his colleagues encouraged him to submit it through official channels and he reluctantly agreed (Gest 2001). On July 19, 1945, Szilard gave the petition to Arthur Compton, director of the Met Lab, for transmittal to the president. However, Compton did not deliver it directly, but rather submitted it through the chain of command – first to Colonel Kenneth Nichols, then to General Leslie Groves, and finally to Stimson’s office.

Before sending the petition along, Colonel Nichols attached a cover letter that stated in part “It is recommended that these papers be forwarded to the President of the United States with the proper comments. It is believed that by such action and example it will be more nearly possible to control the individual activities of the various scientists who have ideas regarding the political and social implications concerning use of the weapon and to confine their activities to proper channels where security for the project will not be jeopardized. Contrary to the hopes of

Mr. Leo Szilard, who started the original petition, thereby precipitating the other petitions, it is believed that these collective papers generally support the present plans for use of the weapon” (Nichols July 25, 1945). Nichols then cited a poll taken among the Met Lab scientists and suggested that 61 percent favored military use of the bomb against Japan (Gest 2001, 14).

The petition finally made its way to Secretary Stimson’s office on August 1, 1945. But both President Truman and Secretary Stimson were in Europe at the time, and George Harrison, Stimson’s assistant, simply placed the petition in a secret file. Szilard later noted, “The petition was sent to the President through official channels, and I should not be too surprised if it were discovered one of these days that it hadn’t ever reached him” (Gest 2001, 15).

The Franck Report, addressed to the Interim Committee, was also transmitted through formal channels. On June 12, 1945, James Franck and Leo Szilard hand-delivered the report to Arthur Compton in Washington, urging him to deliver it directly to Secretary Stimson. Before delivering it, Compton (also a member of the Interim Committee’s Scientific Panel) attached a cover letter to the report. In his June 12, 1945 cover letter addressed to Secretary Stimson, Compton argued that not using the bomb would cost more lives and prolong the war, and “might make it impossible to impress the world with the need for national sacrifices in order to gain lasting security” (cited in Bernstein 1988, 236).

The Interim Committee referred the Franck Report to the Scientific Panel, which considered it at a meeting on June 16, 1945. The panel advised, “we can propose no technical demonstration likely to bring an end to the war; we see no acceptable alternative to direct military use” (cited in Williams 2011, 179). There is no evidence that President Truman ever reviewed the Franck Report or the Szilard Petition before directing that bombs be dropped on Hiroshima and Nagasaki. Military leaders throughout the project had successfully muted the

dissenting points of view raised by scientists. They had not done so by isolating them or removing them from the project, or by threatening to do so. Rather, they had shaped the way in which decision-makers in the War Department and the president's office would perceive the concerns through the cover letters they attached. Perhaps Compton knew what the scientists did not – that a decision had already been made to drop the bombs on two Japanese industrial centers.

In a meeting on May 31 and June 1, the Interim Committee had already unanimously agreed to the military use of the weapons, apparently after a robust debate. As it was later described by Secretary of War Henry Stimson, the decision was not made in a vacuum, but by a committee who had been encouraged “feel free to express themselves on any phase of the subject, scientific or political.” Stimson noted that the committee had advised that “(1) The bomb should be used against Japan as soon as possible (2) It should be used on a dual target-that is, a military installation or war plant surrounded by or adjacent to houses and other buildings most susceptible to damage used without prior warning. In reaching these conclusions the Interim Committee carefully considered such alternatives as a detailed advance warning or a demonstration in some uninhabited area. Both of these suggestions were discarded as impractical. They were not regarded as likely to be effective in compelling a surrender of Japan, and both of them involved serious risks (Stimson 1947, 100) “

Stimson went on to say that, “Even the New Mexico test would not give final proof that any given bomb was certain to explode when dropped from an airplane. Quite apart from the generally unfamiliar nature of atomic explosives, there was the whole problem of exploding a bomb at a predetermined height in the air by a complicated mechanism which could not be tested in the static test of New Mexico. Nothing would have been more damaging to our effort to obtain

surrender than a warning or a demonstration followed by a dud-and this was a real possibility. Furthermore, we had no bombs to waste. It was vital that a sufficient effect be quickly obtained with the few we had” (Stimson 1947, 100-101).

Stimson’s explanation of the decision to use two atomic weapons that ultimately killed 300,000 Japanese was prompted in part by scholars, historians and citizens who later questioned that decision. Evaluating the merits of this decision is beyond the scope of this study. However, the concerns raised by scientists and responses by the director of the Met Lab, War Department, and Army offer an important historical insight relevant to the ways in which dissenting views are raised and resolved at Hanford today.

First, the director of the Met Lab, Arthur Compton, delivered the Franck Report up through his chain of command. He did not toss the report in a file, nor does it appear that he attempted to silence the concerns of scientists’ who worked in his lab. There is evidence, however, that scientists had been frustrated for some time that rules related to secrecy and security restricted the free flow of information among scientists working on various aspects of the project. They were also concerned about compartmentalization of the organization imposed by leaders in Washington, and a general desire for a more democratic inclusion of scientific opinion into policy decisions (see Price 1995). Seen in that light, the concerns raised in the Franck Report and Szilard Petition appear to have been raised internally but not resolved to the scientists’ satisfaction.

Given the secrecy of the Manhattan Project, its importance to ending World War II, and introducing nuclear weapons to the chilling relationship between the U.S. and the Soviets, it seems unlikely that Met Lab scientists would have gone to the media or to Congress to raise their concerns. Although the terms “whistleblower” and “ethical resister” were not yet in common

parlance during that time, it seems unlikely that public opinion would have looked favorably on the scientists had they made their concerns known outside of the War Department or the President's office. Indeed, taking their concerns to the media would likely have been seen as a treasonous act. They would have earned the label of traitors rather than actors with important insider knowledge raising concerns in the hope that they would be resolved in a transparent and democratic fashion.

Arthur Compton likely understood this dynamic. He would have been convinced that the broader policy questions of whether and how to use the atomic weapons would be made within the walls of the War Department. Perhaps he believed he had an obligation only to fulfill his organization's mandate to produce and weaponize plutonium, and to satisfy those in the War Department and Army Corps who seemed intent on using the weapons, perhaps as much to end the war as to establish the U.S. as a powerful actor in the emerging Cold War. For Compton, his mandate had been relatively straightforward. Without oversight by Congress, regulatory agency, or the media, external pressures coming to bear upon the Met Lab organization were essentially nonexistent.

Perhaps the combination of public support for the war, straightforward mission, and lack of oversight drove Compton's response to dissent within his organization. Rather than attempting to contain or mute the responses of the scientists in his lab, he wrote a cover letter that would persuasively discount the concerns raised by the scientists under his direction. Other scholars have noted that "Compton's cover letter would likely have been sufficient to undermine its conclusions, and in any event there is no evidence that Stimson took the petition into serious consideration. Casualty" (Price 1995, 223). In sum, Compton's response to concerns raised

within his organization served as an intermediary between individuals in his organization and political leadership.

As this study discusses in later chapters, the interaction between Compton and scientists within his organization is in some ways similar to today's organizational response to concerns raised throughout the nuclear weapons complex, and Hanford in particular. Organizations today are still stove-piped through contracts across organizations such as private contractors and labs, making collaboration and democratic decision-making at least as challenging today as it was during World War II. However, the strict requirements on secrecy and security have been relaxed since the effort to build the first nuclear weapon. The mandate guiding organizations involved in cleanup today is less straightforward, and the external environment is infinitely more complicated. The responses by organizational leaders are more complex, and as this study argues, still seek to contain or characterize the concerns raised within their organizations.

Plutonium production and politics: shaping culture at the Hanford site

After World War II, responsibility for nuclear weapons production at Hanford shifted from the Army Corps of Engineers to the Atomic Energy Commission (AEC). The AEC was a civilian entity established by Congress that was “deliberately a step removed from the Executive Branch and the War Department” and operated the site for the next 27 years (Findlay and Hevly 2011, 46). After a brief transfer of power to the Energy Research and Development Administration in 1975, responsibility for the site shifted in 1977 to the newly formed Department of Energy - the agency now tasked with the site's cleanup (see table of government agencies and contractors at the Hanford site over time). Although the names and mandates of each agency responsible for the site changed over time, a culture of secrecy sustained throughout

the Cold War until the end of production of plutonium. As Roy Gephart notes, “Officials believed national security, public trust, and company interests were best served by not revealing too much about Hanford operations or containment releases”(2003, 2.3).

Reliance on contractors to construct, operate, and now clean up the site has been a constant throughout Hanford’s history. From the earliest days when DuPont constructed the first reactor at the site, the government has depended upon private entities for capacity, expertise, and experience. When DuPont declined to renew its contract at Hanford, General Electric took over as the prime contractor on September 1, 1946, and just a few months later on January 1, 1947, the AEC succeeded the Army Corps. The change in both the primary contractor and agency responsible for operating the site during the late 1940s caused the site to lose a great deal of expertise that had accumulated during the initial years of operation. Today the site is still characterized by a regular turnover of contractors, prompted in part by a system of competitive bidding.

Table 3.1: Organizations at the Hanford Nuclear Site 1942 - present

Date	Agency Oversight	Contractor or Licensee	Other
1942	Army Corps of Engineers	DuPont	
1946		General Electric	
1947	Atomic Energy Commission		Hanford Atomic Metal Trades Council
1949-present			
1965-present			Battelle - Pacific Northwest National Laboratory
1966-1967			
1967-1977		Isochem Inc.	
		Atlantic Richfield Hanford Company	
1974-present	Nuclear Regulatory Commission* (regulates commercial power production)		
1975	Energy Research and Development Administration (defense)		
1977-current	Department of Energy* (owns and regulates defense sites)		
1984 -present		Energy Northwest*	
1977-1987		Rockwell Hanford Operations	
1987-1996		Westinghouse Hanford Company	
1989- current	Defense Nuclear Facilities Safety Board* (oversees DOE activities)		
1994-present		Bechtel*	
1996-present		Fluor and support contractors	
1999-present		CH2M HILL*	
2005-present		Washington Closure Hanford*	
2008-present		Washington River Protection Solutions*	

*Organizations included in this study

Source: Table derived from a list of agencies and contractors on p. 2.16 in Roy Gephart’s 2003 account *Hanford: A Conversation about Nuclear Waste and Cleanup*. Richland, WA: Battelle Press.

The bombs dropped on Hiroshima and Nagasaki in the summer of 1945 revealed operations at Hanford for the first time – both to its employees and members of the surrounding communities. Colonel Matthias visited communities throughout the Pacific Northwest such as Walla Walla, The Dalles and Spokane, explaining operations at the site and following up with editors who had responded to his requests for secrecy (Findlay and Hevly 2011, 36). It was the site's first overture acknowledging its increasing importance to local economies and communities. The site employed 10,000 contractor workers at the end of the war, and its future was initially uncertain (Findlay and Hevly 2011, 41). Had the site completed its mission?

In the years following the war, it appeared as though it had when the AEC closed down one of the reactors and began running the remaining two at reduced speed. Employment at the site dropped in half in the months following the end of World War II. But in 1949, U.S. intelligence detected the first test of an atomic weapon by the Soviet Union, and in 1950, the Korean War began. Both of these events signified a turning point for the site and established a pattern of dependence upon national security and political support.

For the next several decades (from 1944 to 1988), Hanford would produce nearly 75 tons of weapons-grade plutonium, or one-fourth the world's supply (Findlay and Hevly 2011, 43). As the site settled into its role as an industrial complex, the workforce stabilized and even unionized. During the war years, organized labor had agreed to the Army's resistance to organized unions due to the need for secrecy. But in 1948, the AEC declared that it would no longer object to recognizing unions. On February 8 and 9, 1949, in an election sponsored by the National Labor Relations Board, the Atomic Metal Trades Council for the American Federation of Labor won certification as the collective bargaining agent for plant workers. After that point the Hanford Atomic Metal Trades Council (HAMTC) bargained contracts between workers and contractor

General Electric, although the AEC required approval of many contract provisions and security requirements (Findlay and Hevly 2011, 55). As contractors came and left the site, HAMTC and an experienced workforce of skilled craftsmen and laborers has remained a constant source of capacity and expertise at the site.

Many of the private contractors that have operated at the site also contracted with other defense or military organizations, and military influence is still evident in organizations at Hanford today. Control through chain-of-command and hierarchical structures that began during the early days of construction and operations have sustained throughout the site's history. It was common for members of the nuclear Navy to find work at the nation's nuclear sites, as their military service could be counted toward their pension, and their expertise and training was valuable to both government and private organizations at the site.

Former members of the nuclear navy brought with them a tradition of hierarchy and deference to superiors. As the site settled into plutonium production during the Cold War years, a tradition of secrecy and fragmented knowledge that began during construction was maintained in part through organizational structures that compartmentalized information. As Roy Gephart described, "Relatively few people knew the whole picture. Information was given only to those with a 'need to know.' This kept workers from independently looking into areas not under their responsibility" (2003, 2.4).

In many ways, the organizational structures and culture established during the years of plutonium production have sustained over time. Organizations at the site have been shaped by past approaches to problem solving and those traditions can be difficult to change. As the next section discusses, societal expectations for increased transparency and openness evolved and the Department of Energy and its contractor organizations have responded by outlining a new

mission of cleanup of the site. Despite a change in mission and new generation of leadership and workers, the following chapters suggest that many of the traditional organizational structures and methods of problem solving that were established during the construction and production years remain firmly in place.

Societal expectations: national security and the environment

The amount of contamination released into the environment at Hanford is unimaginable today. Over the nearly 50 years of plutonium production at the Hanford site, 400 to 450 billion gallons of contaminated liquids were discharged into the soil and groundwater. The result is a groundwater plume of metals, chemicals and radionuclides that have spread over nearly 150 square miles. About 25 million cubic feet of waste is buried in landfills on site, and large machines such as contaminated railcars and locomotives are stored in underground tunnels (Gephart 2003, 8-9)

During the first two years of plutonium production, 420,000 curies (a measure of units of radioactivity) of iodine 131 were released from the stacks of the processing plant. In comparison, only 15 curies of iodine 131 were released during America's worst commercial nuclear accident at Three Mile Island in 1979. An estimated 40,000 curies were flushed into the Columbia River during the same time period. During the Cold War production years, with as many as eight reactors operating from 1956-1965, an estimated 10,000 to 12,000 curies were released daily into the river (Williams 2011, 120). In total, an estimated one million curies of radioactivity had been released into the soil, water and air during Hanford's years of plutonium production (D'Antonio 1993, 126).

These releases were largely undisclosed until 1986, when the Department of Energy declassified and released 19,000 pages of documents to the public and investigative journalists (See D'Antonio 1993, 117; Gephart 2003, 2.20-2.24). For nearly forty years, the public had little choice but to generally accept government reassurances that operations at Hanford were safe and had resulted in no unsafe exposure to the public or its workers. But the release of these documents told the story of massive contamination over the years, and internal memos urging warnings to the public that never happened.

One piece of evidence dating back to 1949 particularly exacerbated public alarm and anger. Documents and maps released to the public in 1986 showed that the Atomic Energy Commission and its contractor had begun the process of separating plutonium from irradiated uranium when it was still “green.” In other words, the process normally began after a 90-day cooling period that also allowed some of the fission products to be degraded and not emitted through the stacks during the separations process. The documents revealed that on December 2 and 3, 1949, a ton of “green” uranium was processed after only a 16 day waiting period, resulting in emissions of nearly 8,000 curies up the stacks of the processing plant. Although this was a fraction of the total releases during peak release years of 1945-1947, it was the largest one-day release (D'Antonio 1993, 120-126; Findlay and Hevly 2011, 57; Gerber 2007, 78).

The accompanying maps revealed that contamination had spread as far north as Spokane, Washington, and as far south as the Oregon-California border. The releases of radioactivity were hundreds of times larger than the release at Three Mile Island in 1979. Readings on vegetation were 400 times then permissible limits, and thyroid specimens from animals measured as much as 80 times the amount then accepted for exposures (id). Perhaps most surprisingly, the documents also suggested that unlike the accident at Three Mile Island, releases during the

“green run” were an intentional experiment. On October 25, 1949, the Atomic Energy Commission, contractor General Electric, and the Air Force met and planned the “green run” to test their instruments and develop a formula for determining the volume and rate of production of nuclear weapons by the Soviets (Advisory Committee on Human Radiation Experiments 1995, 320). Scrubbers that had been installed to remove Iodine-131 from stack emissions had been removed during the “green run.”

In 1995, a committee appointed by President Clinton examined the effects of radioactive experiments, found that the releases during the war years had measured as much as 80 times the amount released during the “green run” experiment. Examining the releases from the Hanford site, the committee concluded that harm from ongoing operations had presented more physical harm to surrounding residents than any one event. Although the documents released in 1986 included memos written by individuals at the site arguing that warnings should be issued to the public at various times throughout the years of operation, no such warnings were ever issued. In 1995, the committee appointed by President Clinton noted “that the longer-term costs of secrecy extend well beyond any physical injury that may have been incurred. These costs include, first, the anxiety and sense of personal violation experienced by those who have discovered that they have intentionally and secretly been put at risk, however small, by a government they trusted. But they also include the consequences for that government, and its people, of the attendant distrust of government that has been created (Advisory Committee on Human Radiation Experiments 1995, 318).

Throughout the production years, the AEC and later DOE weighed decisions about risks to public safety such as contaminated salmon in the Columbia River, and milk produced by cows that had consumed grass contaminated with Iodine-131, which came to be understood by

government officials as the primary pathway for human contact with radiation. Yet at each juncture, the agencies determined that contamination levels could alert the Soviets about U.S. production plutonium production levels and methods, and create serious public relations challenges that could compromise the site's mission. As these facts and evidence later came to light, the delay in releasing the information created a "legacy of distrust" and the "government's loss of credibility as a source of information about risk" (Advisory Committee on Human Radiation Experiments 1995, 324).

In the news: media accounts drive disclosure and raise public awareness

Looking back on the years of operation at Hanford, one might wonder why didn't insiders with knowledge of environmental releases press for greater consideration for worker and public safety, and for the environment? In retrospect, the pressure to disclose data about radioactive releases and the impacts of operations came not from those working inside the site's fences, but as a result of public, media and political attention. This pressure emerged over time brought about in large part by shifts in societal expectations and attention. I consider these shifts as falling into three categories: declining trust in science and the government generally, a growing environmental consciousness, and two nuclear disasters.

Declining trust in government and emerging environmental consciousness

Trust in science and in the government reached a high point during World War II. As the country set about rebuilding in the years following the war, other government agencies grew increasingly interested in Hanford operations. In 1949, the Columbia River Advisory Group was established. Comprised of federal, state, and contractor employees, the group was tasked with

working with Hanford officials on radiation safety and waste management. The group envisioned its role to include assisting the Atomic Energy Commission with establishing water pollution and safety plans. But officials at Hanford bristled at the notion of independent oversight (See Gephart 2003, 2.10).

In 1950, Hanford operations manager Fred Schlemmer wrote to AEC officials in Washington D.C., stressing that the advisory group “could be an important and useful medium for transmitting to the general public and local government agencies in the Northwest the high degree of confidence which we ourselves have that we are taking adequate steps to prevent pollution and contamination of the Columbia River (in Gephart 2003, 2.10). The U.S. Public Health Service published a study in 1954 based on data it had collected over the previous two years. The report advised the need for reducing radionuclide releases and conducting future studies. Yet, three new reactors began operating at the site during the 1950s, which significantly increased releases.

We now know of many examples of warnings from within the Atomic Energy Commission and its contractors that were dismissed. These include health officials identifying the need to fit workers with respirators as early as 1947, and the need for ongoing studies of cancer in workers (D’Antonio 1993, 278). Other examples, cited earlier, include decisions not to warn residents of the dangers of airborne releases, or of fishing, or to native tribes with treaty rights to use the land for subsistence purposes. As historian Michele Gerber noted, scientists at the Hanford site conducted data gathering and environmental monitoring in a very thorough and technically sophisticated way. “Yet, Gerber noted, “this precedent setting endeavor faltered by classifying most of the data it collected....How much sooner might the problems of air-borne,

river-borne, and groundwater discharges have been solved and these unique and talented environmental-monitoring scientists had shared their data?”(in Gephart 2003, 3.1)

If trust in government was at an all time high during World War II, it was perhaps at a low point during the Watergate years. This growing distrust converged with an emerging environmental consciousness. The result was increased questioning by citizens, public interest groups, and investigative journalists about the impacts of Hanford operations. No longer were assurances by the Atomic Energy Commission that operations posed no risk to workers or the public taken at face value. Those who questioned sought data and challenged the assumptions of risk and environmental harm that the government agency provided. Some have suggested that it was this growing mistrust that led Congress to dismantle the AEC and ultimately to replace it with the Department of Energy.

As the chart below demonstrates, media attention to issues at Hanford emerged during the early 1970s. Stories detailed accidents at the site, inadequate worker protections, leaking waste tanks, and the beginning of a national dialogue about how and where to create a permanent waste site for high level nuclear waste. Hanford was on the short list of sites selected during the 1980s. In response to a Freedom of Information Act request by an investigative reporter for the Spokesman Review, and public interest group Hanford Education Action League (HEAL), the Department of Energy released 19,000 pages of previously classified documents in 1986. Then DOE manager of the Hanford site, Michael Lawrence, often referred to the need for a change in culture. Unlike managers at DOE’s other sites in the nuclear weapons complex, he believed that the details of operations would ultimately be disclosed. Lawrence was the first to pull back the veil of secrecy.

Commercial nuclear energy at the site

In a way it seems irreconcilable to think that the destructive power of atomic weapons could be used to benefit society. How could citizens be convinced that the same technology that had been used to destroy the cities of Hiroshima and Nagasaki could be harnessed to produce energy safely? Perhaps citizens were more receptive to this message, and to faith in technology and the government in the years following the war. During this time period, the Atomic Energy Commission was tasked with not only regulating the use of nuclear technology and ensuring its safety, but also promoting its use. It developed slogans such as “atoms for peace” and promoted nuclear technology as a source of energy that would be “too cheap to meter.”

During the 1950s, the community of Tri-Cities envisioned Hanford not only as a weapons complex, but as a nuclear center that would serve as a laboratory for new technologies, and a nuclear power producer. In 1957, a consortium of utilities combined to form the Washington Public Power Supply System (WPPSS). The utilities believed that demand for power would double every ten years, outstripping the supply that could be obtained from hydropower. WPPSS issued bonds and developed plans to build and operate five nuclear reactors in the state - three reactors on land leased from the federal government at the Hanford site, and two in Grays Harbor County.

Between 1957 when the consortium was formed, and 1975 when construction began on the first reactor at Hanford, attention by the public and media both increased and turned decidedly negative. Some questioned the safety of nuclear technology, while others criticized transferring knowledge and technology developed by the government to private entities. By 1968, the number of media articles with negative titles outnumbered positive ones for the first time. By the 1980s, when the Columbia Generation Station began operations, negative media

coverage of nuclear power outnumbered positive articles by 20 to one (Baumgartner and Jones 1991, 1055).

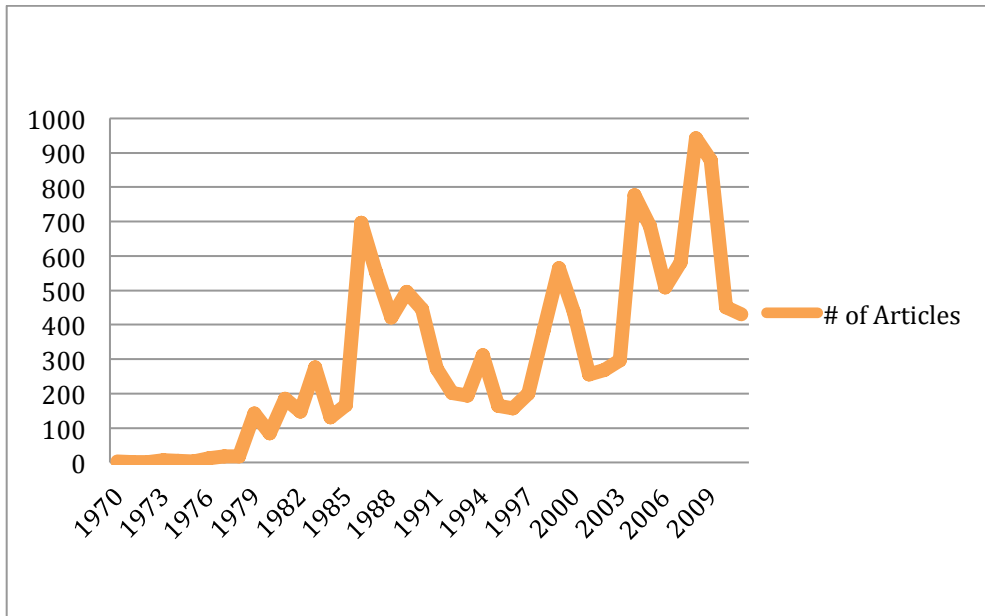
Construction on the Columbia Generating Station began just as oversight for nuclear power shifted from the Atomic Energy Commission to the Nuclear Regulatory Commission. This transfer of oversight resulted, in part, from concerns that the AEC could not effectively regulate an industry it was also tasked with promoting. In response to a new mandate and public demand for safety, the NRC imposed more stringent regulations on reactors, resulting in increased construction costs for WPPSS and other operators.

WPPSS was also criticized for its management of the construction process, and sued by the Washington Environmental Council, which demanded that an environmental impact statement be prepared for the project as mandated by the National Environmental Policy Act, enacted in 1969. Increasingly negative public and media attention, changes in regulatory oversight, and cost overruns related to construction ultimately doomed the consortium's efforts to construct five reactors. WPPSS defaulted on \$2.25 billion worth of bonds. The losses to taxpayers and utility customers have been deemed the largest default in municipal finance, earning WPPSS the nickname "whoops." The two reactors in Grays Harbor were never completed, and today, the cooling towers near Satsop, are visible remnants of the failed project. Only one reactor was completed at Hanford, and today the Columbia Generating Station produces approximately 1,150 megawatts of power – enough to supply power to a million homes. In 1988, WPPSS changed its name to Energy Northwest.

Figure 3.1 below includes major media and newswire articles related to the Hanford site. This includes coverage related to the commercial reactor, bond default, and ensuing litigation by bondholders. It also includes coverage of the site's defense activities including incidents and

accidents, debate over permanent waste storage, declassification and release of documents in 1986, and in recent years, litigation and controversy related to cleanup of the site.

Figure 3.1: Media coverage of Hanford



Source: The data was gathered from a Lexis-Nexis search on October 14, 2013. The search included all major newspapers and wires, and small town newspapers, and filtered out “highly similar” articles. Search terms included “Hanford” and “nuclear” or “atomic.”

Political attention: responses to changing social consciousness and media coverage

Just two months after DOE’s Manager for the Hanford site, Michael Lawrence, released 19,000 pages of documents, a nuclear accident gained worldwide attention. On April 26, 1986, the Chernobyl reactor exploded and burned uncontrolled for two weeks. Two U.S. labs estimate that the accident released between three and 4.5 billion curies of radiation. This accident followed the partial meltdown of a commercial reactor at Three Mile Island on March 25, 1979. The commercial reactor near Harrisburg, Pennsylvania, released approximately 13 million curies

of radioactive gases, although the most harmful emission - Iodine-131 – was estimated at 20 curies. Taken together, these two accidents, and the ensuing media and public attention, garnered the attention of members of Congress.

In 1979, thirty-six different congressional bodies held a total of ninety-four hearings on nuclear power (Baumgartner and Jones 1991, 1062). This level of attention followed an increasing trend in the number of hearings held each year, and the number of committees and sub-committees claiming oversight over nuclear power. In the days and weeks following the accident at Chernobyl, the public interest advocates and the media noted similarities between the design of the reactor at Chernobyl and N Reactor at the Hanford site. In 1986, Congress held seven hearings specifically related to the Hanford site, and eighteen the following year (ProQuest Congressional).

Robert Alvarez, a former staffer for Senator John Glenn reflected on his work on the DOE weapons complex in an interview conducted for this study (December 5, 2011). He said, when he joined the Senate Governmental Affairs committee, there were stories related to DOE in the *New York Times* for three months. Stories highlighted the age and deterioration of the infrastructure throughout the weapons complex, he said. Sources of contamination, such as production plants, and later waste tanks, resulted in pressure from Congress to come to terms with the danger of these sites. In 1988, President Bush said that health, safety and the environment should be a priority at DOE sites.

In response to media and political attention, DOE Manager Michael Lawrence offered reassurances about the safety of N Reactor. Secretary of Energy John Herrington appointed a panel to assess the condition of N Reactor and make a recommendation about its future. In 1987, the reactor was put on “cold standby” for maintenance and refueling. But in 1988, the Reagan

administration made the decision to shut it down permanently. N Reactor, which had produced both plutonium and electrical power, had been dedicated by John F. Kennedy in 1963. During its twenty-four years of service, attention to nuclear safety and energy production had heightened and turned decidedly negative.

Even in the state of Washington, political support for the site waned in the wake of Chernobyl. During the 1980s, the site brought in approximately a billion federal dollars per year. Politicians in the state and Tri-Cities area in particular, had long been boosters of the site. But in 1986, Democrat Brock Adams sought a seat in the U.S. Senate by campaigning against continued operations at the site and called for the shutdown of N Reactor. Incumbent Slade Gorton, a Republican and Reagan administration supporter, criticized the Department of Energy in television ads. Adams narrowly defeated Gorton. It was the first time that Washington State had elected a U.S. Senator who was not a reliable supporter of the site (D'Antonio 1993, 190).

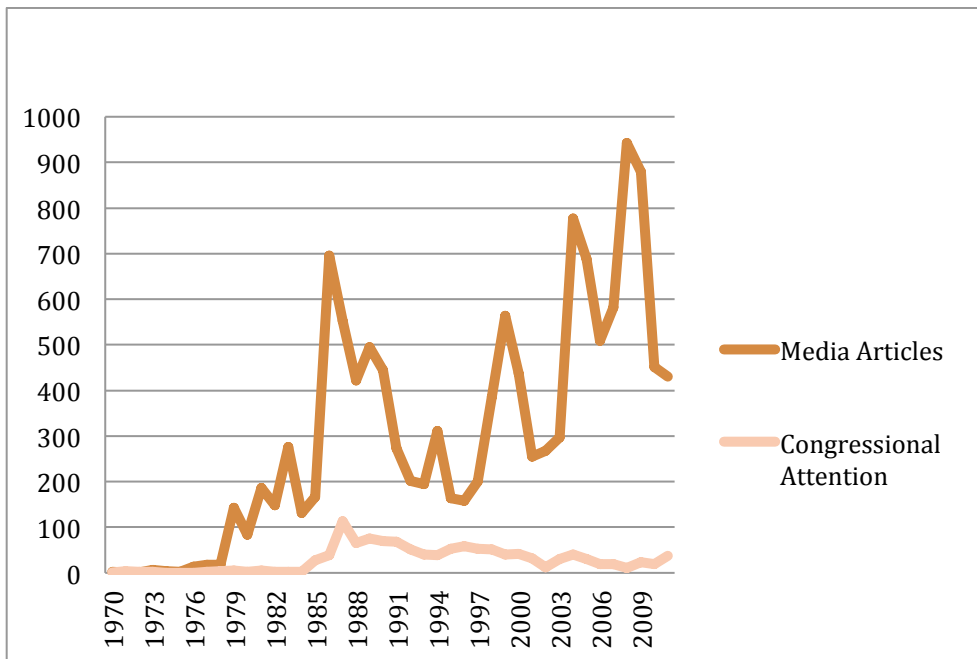
Robert Alvarez summarized all of the factors that came together during the 1980s that brought an end to plutonium production during the 1980s. Social expectations for increased disclosure, and the accident at Chernobyl fueled media and Congressional attention to the weapons complex. The states that were home to twelve weapons complexes, including Washington State, became nervous about environmental contamination and feared they would be caught “holding the bag” on cleanup.

Revelations of the crumbling infrastructure and levels of contamination at these sites, coupled with these other shifts in societal expectations, created a “churning” in the political environment that caused the weapons complex to implode on itself nearly before the end of the Cold War. Alvarez reflected back on this time, noting that safety consciousness and responses to workplace concerns are affected by the political environment, creating an ebb and flow in

workers’ willingness to raise concerns. During the 1980s, he said, there was political support for Congress coming down hard on the Department of Energy. The political and media environment surrounding DOE created a “flow,” or responsiveness to insider’s concerns. Today, Alvarez said, we are in an “ebb.”

Figure 3.2 below adds Congressional attention to the figure depicting media coverage above. The chart shows increased media and Congressional attention during the mid to late 1980s. It also seems to support the notion of an ebb and flow in Congressional attention. Despite increased media attention of Hanford beginning in 2008, Congress has held few hearings and shown significantly less attentiveness than it did during the 1980s.

Figure 3.2 Congressional and Media Attention of Hanford



Source: Data for this portion of the chart was gathered from a search of ProQuest Congressional on October 14, 2013. The search includes the terms “Hanford” and “nuclear” or “atomic.” It includes published hearings, content in the Congressional Daily Record, House and Senate documents, and all legislative histories.

Hanford's history remains present in today's challenges

The end of the Cold War ushered in a new mission for the DOE complex. Rather than plutonium production, the agency would be tasked with addressing legacy contamination that had accumulated over nearly five decades. The Department of Energy faces a much more complex organizational environment than did its predecessors during the production years. As Gephart notes, "Plutonium production was done in secrecy; cleanup is an open book being written through an evolving social consensus and understanding of the problems faced" (2003, v).

During the late 1980s, the Department of Energy estimated the cost of cleaning up the entire complex at \$200 billion. When President H.W. Bush took office, his new Office of Management and Budget Director, Dick Darman asked DOE Secretary John Herrington, "Well, just how bad is this thing? How much is it going to cost?" Herrington answered, "Dick, it's going to take everything you've got" (D'Antonio 1993, 263). On May 15, 1989, the Department of Energy, Environmental Protection Agency, and the Washington State Department of Ecology entered into an agreement known as the "Tri-Party Agreement" outlining legally enforceable milestones for cleanup (Department of Energy, Environmental Protection Agency, and Washington State Department of Ecology). The agreement established a 30-year timetable for cleanup.

Since the agreement was signed in 1989, 2,300 tons of spent fuel have been placed in long-term, dry storage, 798 sites along the Columbia's south shores have been remediated, 12,000 cubic meters of waste stored underground has been removed, eight billion gallons of contaminated groundwater has been treated, and six of the nine reactors have been "cocooned" to

secure them until a time when they are safe to demolished.³² Despite significant progress in cleaning up some areas of the site, and \$30 billion in expenditures, cleanup is estimated to be only one-third complete (Oregon Department of Energy 2009, i). Cleanup is now expected to extend in the 2060s and cost an additional \$113 billion (Cary 2014).

The radioactive material stored in 177 underground tanks has proven among the most challenging aspects - both technically and politically - of cleaning up the Hanford site. The tanks contain layers of liquid waste on top of semi-solid material and “salt cake” encrusted on the bottom. The vapors in the headspace of each tank contains up to 1,200 different chemicals, many of which are known to be harmful to workers tasked with monitoring and tanks and transferring the waste into double-shelled tanks, and ultimately to a plant that will “vitrify” the waste into glass logs for long term storage.

The contents were generated primarily during the process of chemically separating plutonium, although these tanks have also served as a receptacle for radioactive odds and ends such as tools, rubber gloves, and beagle bones (the subject of early experiments of the effects of radioactivity on living things). Add to this mix waste that was generated at other sites within the nuclear complex and transferred to Hanford, and the result is a highly variable and largely uncharacterized set of waste that must ultimately be stabilized and stored safely for the next ten thousand years.

The Tri-Party Agreement stipulated that construction of a “vitrification” facility or “vit plant” would be underway by 1991, and complete in 1999 at an estimated cost of \$1 billion. As of this writing in late 2013, the plant is in its fourth iteration, is nearly 60% complete, and has already cost \$12 billion. Estimated costs for construction and operation of the plant over its “life

³² <http://www.doe.gov/articles/update-hanford-site-and-cleanup-progress>, accessed October 25, 2013

cycle” have exceeded \$100 billion. The vit plant is the cornerstone of cleanup at Hanford as it will stabilize the site’s most volatile waste of most significance to the surrounding communities and environment. Cost overruns and unresolved technical challenges have been identified in Government Accountability Office (GAO) reports and DOE internal assessments.

In two separate reports in 2004 and 2006, the GAO alleged DOE management of the project had led to cost overruns and failure to meet goals, as well as unresolved safety concerns (Government Accountability Office 2004, 2006). Internal assessment by the Department of Energy in 2005 and 2008 found deficiencies in contractor Bechtel’s “culture” for raising safety concerns, and in 2008, levied a civil penalty against the contractor (Department of Energy September 15, 2008; Department of Energy 2005). This attention by Congress and DOE was coupled with an increasing number of media articles related to Hanford, and a nascent worry among stakeholders throughout the region that Congress might lose faith in the vit plant altogether, defunding the project without a feasible alternative for disposing of the 56 million gallons of waste at the site.

Energy Northwest, the commercial power operator at the site, also faced increased media attention as it applied for a renewal of its license to operate the plant. Public hearings were scheduled by the Nuclear Regulatory Commission just as the disaster took place at Fukushima plant in the wake of a devastating earthquake and tsunami. As with Chernobyl and N Reactor, the local media pointed out similarities between the design and geology of Fukushima and the Columbia Generating Station. Earlier in the decade, proponents of nuclear energy and environmentalists allied to foment what many considered to be a renaissance in nuclear power. But a new day for nuclear power, if there was one, appeared to have come to an end with the meltdown of the reactors at Fukushima.

Interviews for this study were conducted during this period of heightened public and political awareness about the technical problems associated with the vit plant, and renewed concerns about the safety of nuclear power. From regulators and contractors to workers and advocates, those interviewed communicated a keen sense of the attention to workplace traditions as well as pressures coming to bear on organizations from the political and regulatory environments. Based on their descriptions of the power dynamic that these factors come together to create, it is not surprising that scholars and practitioners have attributed retaliation against whistleblowers to weaknesses within legal statutes and adjudication of claims, and to willful, rational evasion of these laws by organizations.

These criticisms have merit. But they also underestimate other factors that influence organizational responses to law and the perceptions of individuals within the organizations.

Conclusion: organizational decision processes and responses to law at Hanford have been influenced by changes in their environment

This chapter's review of the history of the development and production of nuclear weapons generally, and the operations at Hanford specifically, illustrates the ways in which social expectations, and political and media attention have changed over time. But in many ways, today's organizations at Hanford appear to espouse the values of yesteryear in their desire to contain and resolve conflict internally, and to frame dissent as a threat to national security and production of weapons.

The nuclear defense industry, like other collectives, has developed and perpetuated a common store of knowledge, shared beliefs, and way of processing information that influence organizational decision-making and action (Rojot 2008; Scott 1987). At the same time,

organizations at Hanford have responded to changes in their environment by constructing “rational myths” or new structures and processes that signal responses to new demands (Edelman, Uggen, and Erlanger 1999; Meyer and Rowan 1977; Scott 1987).

For example, organizations at Hanford have in the past two decades adopted new procedures, managers, and processes for reporting concerns internally. These changes have come in response to new societal expectations for accountability, court rulings identifying internal reporting as protected activity, new rules and contract provisions set forth by regulators, and professional organizations offering solutions to demonstrate compliance with whistleblower protection laws.

These new organizational structures may satisfy the demands of their environments, but come at the cost of interrupting the daily activities related to production and cleanup milestones (Meyer and Rowan 1977). One way organizations cope with this tension is to maintain a “loosely coupled” state where formal processes and informal practices aren’t always aligned (Downs 1967; Meyer and Rowan 1977). This allows an organization to benefit from increased legitimacy and resources associated to legal compliance, while at the same time, relying on informal processes to quell dissent.

The following chapters suggest that organizational responses and perceptions vary with the levels of attention and pressures in their environment. Increased media and political attention, and heightened public concern result in increased and tougher oversight by regulators. This may offer insiders a more receptive audience outside the organization, but it also suggests, ironically, that organizations are more likely to violate a worker’s right to raise concerns during times of heightened attention.

Chapter Four:

REGULATING SAFETY AT HANFORD

“The ultimate goal ... is to foster a climate of open communication among employees and their management in order to resolve problems at an early stage and achieve a workforce where employees feel free to express their concerns without fear of reprisal. This would include enhancing open communication, assuring a zero tolerance for reprisal, and fully implementing total quality management initiatives, as employees and management mutually address concerns as the normal means of doing business.”

Department of Energy Secretary Hazel O’Leary in a 1994 Letter to Stakeholders Regarding New DOE Whistleblower Initiatives

When Secretary O’Leary outlined her new initiative on whistleblowing, it had been twenty years since Congress passed a section of the Energy Reorganization Act outlining protections for those who raise concerns, and two years since those protections were formally extended to DOE contractor employees. In correspondence to Secretary O’Leary and in Congressional hearings, public interest advocates, whistleblower attorneys, and workers who had blown the whistle had criticized the Department of Energy’s implementation of whistleblower protections. But criticisms were not limited to the Department of Energy. In 1993, the Nuclear Regulatory Commission established a review team in response to criticisms about NRC’s program for protecting workers who raise health and safety concerns. The NRC responded by promulgating a formal rule in the Code of Federal Regulations in 1996.

The response to criticisms by each of these agencies is emblematic of their overall approach to implementing whistleblower protections. While the Department of Energy proposed a policy of openness, the Nuclear Regulatory Commission established an enforceable rule. In this chapter, I show that these differing responses are the product of each agency’s mandate, history and culture, as well as the unique political, media and societal forces within their environments. I show how each of these forces comes to bear on the regulatory agency, and how in turn, each

agency responds through formulating an implementation and enforcement strategy. I compare and contrast each of the approaches taken, and show how these differing regulatory approaches flow down through the regulated entities, influencing their responses and ultimately, decisions by workers on the ground.

Agencies respond to, and in some cases, harness societal expectations for increasingly democratic workplaces and safe operations. Enforcement strategies that include the presence of on-site inspectors, financial penalties and investigations influence the priorities of regulated entities. Finally, the signals that regulators send to individuals can encourage workers to report concerns to regulators if they are unable to resolve them within their own organizations. Agencies prompt new processes for resolving concerns and expectations among workers about how they will be treated if they raise concerns in the workplace. These findings suggest that regulatory agencies are influential in shaping priorities and decision-making by individuals within regulated entities.

Oversight of nuclear activities

The Nuclear Regulatory Commission and the Department of Energy share common roots in the history of nuclear activities in the United States. In many ways, these organizations are linked together by the common political and societal priorities and pressures outlined in the previous chapter. On the other hand, their unique mandates, organizational culture and structures, and relationships to the executive and legislative branches have brought about very different approaches to regulating. The following discussion traces the pressures that have come to bear on each agency tasked with oversight at Hanford.

In 1974, Congress separated responsibilities for safety from the regulation, development and promotion of nuclear energy. Authorized by Congress in 1974, the Nuclear Regulatory Commission was tasked with ensuring the safe operations civilian nuclear activities. As outlined in the authorizing legislation, the five NRC commissioners are appointed by the president for five year terms, and no more than three members may represent one political party. The NRC's annual budget is approximately \$1 billion with about 90% of its budget derived from fees or fines assessed to its licensees. When Congress established the NRC, many of same people who worked for the old Atomic Energy Commission continued working at the new agency. These individuals were tasked with a new mission and set of priorities, but their experience and expertise would shape the ways in which they approached their new mandate.

Even some insiders within the old AEC had questioned some safety decisions made by the agency, which they believed were more focused on the promotion and approval of new reactors than their safe operations (Campbell 1988). Their concerns were received differently by an agency tasked solely with the safe operation of new reactors, and against a backdrop of increasingly negative public and Congressional sentiment about nuclear power. In addition, financial markets were increasingly skeptical of the stability of utilities investing in nuclear power due to the high costs and new standards set by the NRC. In the wake of the meltdown of a reactor at Three Mile Island in 1979, the NRC was empowered politically to take hard line on nuclear operators, backed by public and media perceptions that the nuclear industry as risky, expensive, and unreliable.

When Congress established the NRC in 1974, it also dismantled the old Atomic Energy Commission and transferred oversight of defense nuclear sites to the Energy Research and Development Administration. But the energy crisis of the mid-1970s prompted President Carter

and Congress to form a cabinet level department tasked with comprehensive energy planning. Responsibility for the nation's nuclear complex transferred to the newly authorized Department of Energy in 1977. The Secretary and Deputy Secretary of DOE are appointed by the president. Today, the Department of Energy's annual budget is approximately \$25 billion and is dependent upon Congressional appropriations for its entire budget.

Although they share a common heritage, the NRC and DOE developed their own cultures and enforcement strategies. Each was shaped in part by components of the old AEC that they had inherited. But they faced different technical challenges and levels of public and political attention over time, as described in the previous chapter. Their responses to a changing environment were filtered through the lens of their own histories, mandates, relationship to the executive and legislative branches, and budgets. The Department of Energy is dependent upon Congress for funding, whereas the Nuclear Regulatory Commission derives nearly all of its budget from licensing fees and penalties charged to its regulated entities. The DOE is tasked with a broad mandate including cleanup of defense sites, while the NRC's mandate emphasizes public safety. These inherent differences shape agency priorities and relationships with their licensees and contractors.

The Department of Energy owns defense sites and is responsible for their safe cleanup, as well as regulating safety. It is dependent upon the contractors it hires to do the work, creating a situation that some have deemed the "fox guarding the henhouse." On the other hand, the NRC doesn't own any of the facilities it regulates, so it doesn't face an inherent conflict of interest. NRC enforces its safety policies through rules promulgated in the Code of Federal Regulations, while the Department of Energy is largely dependent upon contracts to enforce its rules and standards for safety.

In response to public concerns over legacy contamination at defense sites and subsequent media exposes and Congressional investigations, Congress established a separate entity to oversee the Department of Energy's activities. In 1988, Congress authorized the Defense Nuclear Facilities Safety Board (DNFSB) to oversee the safe clean up the nation's nuclear weapons complex. Members of this oversight board are appointed by the president for five year terms. The DNFSB has no formal regulatory authority, but may provide technical expertise to DOE, conduct investigations, hold hearings, and make recommendations to which the Secretary of Energy must respond. The Board's annual budget is based solely on Congressional appropriations of approximately \$30 million.

Agency Responses to a Changing Environment

Following the meltdown at Three Mile Island in 1979, the NRC developed new safety and regulatory approaches that recognized regaining public trust was of paramount importance. Given the increasingly negative Congressional attention and public opinion, and lack of support from the financial markets, the last application for a new reactor was approved in 1978, and no new reactors would ultimately be approved until 2012. The NRC focused on its mandate to oversee the safe operations of existing reactors. While the AEC had conducted 500 annual inspections of nuclear plants in the early 1970s, the NRC conducted an average of 3,000 inspections by the mid-1980s. Inspections signaled a shift in the regulatory and safety paradigms for the commercial nuclear industry (Baumgartner and Jones 1991, 1060)

The NRC developed rules that emphasized technical expertise, consistent operating procedures, and transparency. While the AEC had developed an average of 15 rules or amendments per year, the NRC enacted roughly four times as many rules and amendments

during the mid 1970s (Baumgartner and Jones 1991, 1059). Increased oversight of nuclear operators corresponded with levels of attention by Congress. Baumgartner and Jones note, “Changes in congressional activities led in turn to greater regulatory activity, as for example when regulators requested, then received, authority to impose expensive fines on utilities found in violation of safety regulations (see Jones and Baumgartner 1989). The two venues are tightly linked, and changes in one are rapidly seen in the other” (Baumgartner and Jones 1991, 1061). Taken together, new rules and increased inspections backed by Congressional support, signaled to regulated entities a significant shift in the regulatory environment.

The NRC also established a presence at each reactor. For example, the NRC initiated the use of resident on-site inspectors after the incident at Three Mile Island, and the practice continues to this day. Inspectors are transferred regularly among the sites to avoid any appearance of becoming too close to the nuclear generator or workers. Similarly, because many generating plants are located in relatively small communities, the NRC established rules to ensure that inspectors don’t become too embedded within their communities, for example, discouraging an inspector from coaching or sponsoring their child’s baseball team. Other rules promulgated by the NRC include public participation in the licensing process, and public notice of violations of safety rules or incidents at nuclear facilities. Under 10 CFR § 2.790 most enforcement actions are publicly available through the NRC’s online electronic database.

The NRC again faced political attention and public outcry following a *Time* magazine article published in 1996 that provided detailed accounts of safety failures and retaliation against whistleblowers at the Millstone plant in Connecticut. The agency again responded, this time by adopting a rule making retaliation its own violation. The rule defined in 10 CFR § 50.7 follows the statutory language outlined in Section 211 of the Energy Reorganization Act. Retaliating

against workers engaged in protected activities such as raising concerns outside their chain of command may result in revocation, suspension, or non-renewal of a license, civil penalties, or other enforcement action.

These rules further strengthened 10 CFR § 50.5, a rule promulgated by the NRC which became effective on September 16, 1991. Known as the “Deliberate Misconduct” rule, it provided for direct accountability and action against employees of organizations and employees of contractors or subcontractors of organizations (including a supplier or consultant) who engaged in deliberate misconduct, including harassment, intimidation, retaliation or discrimination of any employee who raised a safety concern. Under the rule, supervisors and managers can be banned from employment in the commercial nuclear industry (Nuclear Energy Institute 2003, 5).

The NRC also established an employee allegations hotline and the number is shown prominently on the home page of its website. If the agency receives a number of complaints it considers out of the ordinary, it will conduct an investigation at the licensee’s expense. Further, if a formal claim of retaliation is filed with the Department of Labor, NRC does not wait for the claim to be adjudicated. Based on a Memorandum of Understanding it signed with the Department of Labor, the NRC does not seek to provide restitution to the employee (which is within the jurisdiction of the DOL), but it will undertake enforcement action against the licensee if warranted by its investigation of the case.

The Department of Energy also responded to changes in public attention to a legacy of pollution kept secret under the guise of national security until the mid 1980s. Amid a spate of investigative media stories released by the *Spokesman Review*, the *Oregonian* and the *New York Times*, and increased Congressional oversight, the DOE responded in part by establishing a

policy of openness (Department of Energy 1994). The Openness Policy, promoted by Secretary Hazel O'Leary, focused on establishing zero tolerance for reprisals, increasing the use of mediation in whistleblower cases, and eliminating reimbursement for contractors' litigation expenses in whistleblower cases. In 1992, Congressional amendments to the Energy Reorganization Act extended whistleblower protections to employees of contractors at DOE sites, where only federal employees had been protected before (Garde 2000). In 1993, the Department of Energy issued Order 5480.29, establishing an Employee Concerns Program within the Department of Energy.

DOE also promulgated rules outlining a procedure for workers to file a concern. In 10 CFR § 708, DOE established an internal procedure for employees of contractors to file a complaint internally with the Department of Energy. The agency encourages this use of this mechanism, however, workers names are not kept confidential and a claim must be filed within 90 days of the date the alleged retaliation occurred. A worker must also have exhausted all other internal means of resolution. Unlike NRC, the Department of Energy did not adopt a rule making retaliation for reporting concerns its own violation. The Department of Energy does not generally initiate its own investigation when an employee files a claim with the Department of Labor. Instead, it may evaluate the DOL findings before initiating an investigation. Under 10 CFR Part 820, the Department of Energy may use information collected by the Department of Labor in an investigation as the basis for levying civil penalties against a contractor (Garde 2000, 2)

The Department of Energy generally takes a more collaborative approach to regulation than does the NRC. For over a half century, DOE has been dependent upon contractors for technical expertise and completing the mission of weapons production and then cleanup. While commercial operations are generally routine and guided by standard operating procedures known

as “conduct of operations,” defense sites have a history of first-of-a-kind activities that depend upon expertise and shared knowledge. Although defense sites have adopted a “conduct of operations” approach, the legacy of expert-based decision-making based on historical knowledge and taken-for-granted practices still exists informally. Although it considered implementing an overall enforcement program similar to NRC, DOE did not end up taking this approach (see preface to final rule, Department of Energy 1993). Unlike the arms-length approach that NRC takes to oversight, DOE and its contractors are very much embedded within local communities - often serving as the life-blood of the economy and a powerful force in local politics.

Many have pointed out that DOE’s role as regulator is compromised by its dependence upon contractors to complete work and meet milestones required by statute or legal agreements. Rather than a coercive or punitive approach, DOE emphasizes general policies and orders over regulations, and settlement talks following violations of nuclear safety or contract requirements rather than fines or penalties.

Recognizing the limits of its oversight authority, the Defense Nuclear Facilities Safety Board has often worked collaboratively with the Department of Energy, providing technical expertise in the design and construction of facilities needed to complete the cleanup of the defense site, and solving problems at sites. DNFSB’s mandate in part was to restore public trust in the Department of Energy following revelations of massive contamination at its sites, and to provide regular updates to members of Congress. In keeping with this mandate, the DNFSB publishes its recommendations to the Secretary of Energy in the *Federal Register* and regularly seeks public comment. It also publishes its annual report to Congress, transcripts of public hearings, and statements of board policies.

However, in response to litigation filed by two environmental groups, the DNFSB argued in its early years that it was not an agency subject to the Sunshine or Freedom of Information Acts. Following the suit, the DNFSB promulgated rules allowing for private deliberations with DOE officials, and with each other on recommendations to the Department of Energy. The rules were challenged but upheld in court. The DNFSB reasoned that following strict rules of public notice and opening all meetings to the public would compromise its mandate to respond quickly to provide technical expertise and to provide frank advice to Department of Energy officials on matters of safety, especially in time-sensitive situations.

In sum, the entities tasked with enforcement and oversight of nuclear safety differ in important ways - from enabling legislation and mandates to funding stability and partisanship. Over time, each developed its own unique approach, culture, and reputation. The following chart summarizes the history and regulatory approach of the three entities responsible for enforcement and oversight of nuclear safety:

Table 4.1: Comparison of Regulatory Agencies at Hanford

	NRC	DOE	DNFSB
History	Authorized in the Energy Reorganization Act of 1974 to oversee commercial nuclear operations	Authorized in the Department of Energy Organization Act of 1977 to oversee production and later cleanup of defense nuclear sites	Authorized in the National Defense Authorization Act of 1989
Mission & Motivating Forces	Ensure the safe use of radioactive materials for civilian purpose, protect people and the environment	Secure national arsenal, meet cleanup milestones, and agreements reached through consent decrees	Provide technical expertise that can reduce safety and design risks and cost overruns
Site ownership	No	Yes	No
Leadership	Five member commission appointed by the President for 5 year terms, may have no more than 3 members from one party	Secretary and Deputy Secretary appointed by the President, serves as a member of the President’s cabinet	Five member board selected by the President as “respected experts in the field of nuclear safety,” to five year terms
Implementation of whistleblower provisions	Rule in Code of Federal Regulations and Licensing Agreements	Policy statement in the Code of Federal Regulations, Orders, and Contracting Agreements	
On-site Inspectors	Yes	No	At selected sites
Investigations resulting from whistleblower claims	Initiates investigation before conclusion of DOL process	Waits for findings of DOL investigation	Discretionary approach, prioritizes and investigates concerns it deems important, conducts public hearings
Nuclear safety approach	Conduct of operations	Expert based	Technical assistance and advice
Primary funding sources	~ \$128 million annual appropriation with 90% fee recovery of its annual budget from licensees	~ \$25 billion annual appropriation (~\$20 billion for design and construction)	~ \$28 - \$30 million annual appropriation

Source: Table compiled by author

Agency influence on workers' willingness to raise concerns

In order to examine how agency influence plays out on workers' willingness to raise concerns, I gathered data and interviewed workers and managers from five different organizations operating at a site in southeastern Washington. State. The Hanford site is a 586-square mile site that produced plutonium for WWII and the Cold War. Plutonium production ended in 1988, leaving behind the most polluted site in the western hemisphere. During the production years, over 440 billion gallons of chemical and radioactive waste had been dumped, contaminating 230 square miles of contaminated groundwater. Over 56 million gallons of high-level nuclear waste remain buried in underground tanks. The site is owned and regulated by the Department of Energy and currently employs 11,000 workers (more than were employed during production years).

The only operating reactor at the site sits adjacent to the Columbia River and is leased to Energy Northwest for the purpose of generating power. The Columbia Generating Station consists of one reactor regulated by the Nuclear Regulatory Commission. The Columbia Generating Station received its construction permit in 1973 and began operations in 1984.

These two sites are nearest to the Tri-Cities, a community of about 250,000 in southeastern Washington State. While they are geographically proximate to each other and to their community, perceptions among workers about their willingness to raise concerns are substantially different. Interviews with workers at the Hanford site and at Energy Northwest suggest that they are very mindful of regulatory requirements and incentives.

Interviews and surveys

At the Hanford site, many workers suggested that their managers are receptive to concerns and they believe work is conducted safely. Nearly every worker interviewed suggested that their first line managers are most influential in determining their willingness to raise concerns. Workers and managers described a job planning process where workers are involved and health and safety representatives are included. However, employees of one DOE contractor suggested that recent changes have largely excluded workers from the planning process, made safety training voluntary instead of mandatory, and eliminated “safety councils” comprised of workers, union representatives and managers which previously kept a running list of the top ten safety priorities that needed to be addressed.

Some workers interviewed suggested that official policies don’t always translate into actions in practice. Although DOE has official policies and directives aimed at encouraging workers to raise concerns, workers often receive different messages. One worker described this dichotomy as the difference between an “open door” policy, which is the stated policy of encouraging workers to raise concerns with their manager, and the “back door” policy. Faced with pressures to meet cleanup milestones, managers may find ways of discouraging workers from raising or recording concerns that may slow down the pace of work, pressuring workers to work without protective equipment, assigning less desirable jobs to workers who raise safety concerns, or dismissing concerns altogether. These kinds of work-arounds or “back door” policies, over time, discourage workers from raising concerns. Moreover, workers at the Hanford site are mindful that the Department of Energy faces the same pressures as the contractors it regulates to meet cleanup milestones, and perceive that their concerns may not receive a fair hearing if reported to the regulator.

Workers at Energy Northwest are mindful of their obligation to ensure the safety of the public and believe decisions about raising concerns should be made with that obligation as a touchstone. As with many Hanford workers, they identified workplace programs for job planning and identifying and prioritizing safety concerns. The union, management and workers collaborate to develop and maintain a “top ten” list of safety priorities. They are encouraged to observe their co-workers and identify safety hazards. In addition, they are encouraged to submit these observations (without names) to management, which publishes and tracks trends in safety practices. Finally, workers at Energy Northwest perceived that managers were motivated to resolve their concerns because concerns raised with the NRC could lead to an investigation into the plant’s safety culture at the expense of the company.

The attitudes towards raising concerns were markedly different between workers whose organizations are regulated by the Department of Energy and by the Nuclear Regulatory Commission. Those who worked in DOE-regulated entities were mindful of DOE’s mandate to clean up sites, dependence on continued Congressional support and funding, and the pressures that the Tri-Party agreement creates to meet milestones. As described by Robert Alvarez, workers in DOE-regulated organizations seemed to have the sense of an “ebb” in DOE’s willingness to respond to worker concerns because of those external pressures. Workers at the NRC-regulated entity acknowledged the agency’s priority for safe operations. Interviews took place just a few short months after the meltdown at Fukushima, and workers had the sense of linked fate – that an accident at one reactor in the United States could affect the economic viability and political support for each of the 104 operating reactors. Unlike workers in the DOE-regulated entities, workers at Energy Northwest seemed to sense a “flow” or high level of responsiveness in the NRC’s receptiveness to workers’ concerns.

In order to determine if these interviews were representative of all workers within these organizations, I obtained copies of surveys conducted by Energy Northwest and the Department of Energy. The surveys conducted by these two entities asked slightly different questions, but key questions were very similar in their wording. The surveys indicate that workers in the NRC-regulated entity were generally more confident about their ability to raise concerns, responsiveness of their manager, and the avenues for raising concerns. The following highlights responses to comparable questions:

Table 4.2: Survey of individuals in organizations at the Hanford site

	NRC	DOE			
	Energy Northwest	Bechtel Waste Treatment Plant (BNI)	Ch2M HILL Plateau Remediation Company (CHPRC)	Washington River Protection Solutions (WRPS)	Washington Closure Hanford (WCH)
Responsibility to raise concerns	99%	98%	97%	95%	93%
Work culture conducive to raising concerns	98%	87%	89%	88%	78%
Management supports a questioning attitude/ raising concerns	95%	89%	91%	87%	79%
Can raise issues without fear of retaliation	95%	88%	89%	91%	83%
Manager takes appropriate action when concerns are raised	95%	78%	84%	82%	74%
Familiar with company's Employee Concerns Program (ECP)	97%	94%	90%	84%	90%
Confidence that confidentiality would be protected by ECP	93%	56%	63%	55%	33%
Confidence that concerns raised through the company's ECP would be resolved	93%	47%	53%	50%	33%

Source: Table compiled from 1) Energy Northwest Survey 2009, and 2) Department of Energy Employee Concerns Program: Federal/Contractor Survey 2009

Avenues for raising concerns

Employees at both NRC and DOE regulated sites may raise concerns through an Employee Concerns Program (ECP) within their own organization. The NRC has not formally mandated that licensees maintain an ECP, although it has set forth an expectation that “licensees and other employers subject to NRC authority will establish and maintain a safety-conscious work environment in which employees feel free to raise concerns both to their own management and the NRC without fear of retaliation. A safety-conscious work environment is critical to a licensee’s ability to safely carry out licensed activities” (1996). Most licensees have established an Employee Concerns Program in the interest of meeting this policy objective and providing an alternative for employees to raise concerns.

In 1999, the Department of Energy issued a similar policy statement of “zero tolerance for all reprisals against or intimidation of employees who have reported concerns” (DOE Order 442.1). Although not a regulatory requirement, the order established an Employee Concerns Program to safeguard the free and open expression of concerns by employees of the Department of Energy and its contractors. The Department of Energy issued a guide advising that contractors establish employee concerns programs to supplement, not replace, existing mechanisms for raising concerns in the workplace (Garde 2000, 4).

In addition to reporting to their own organization’s Employee Concerns Program, workers at both NRC and DOE regulated sites may file a concern or allegation with their respective regulator. The NRC has a prominent link on its home page for anyone to report a concern, or as the NRC refers to them, an “allegation.” Concerns may be filed by DOE employees and contractor employees, either at DOE field offices or with DOE headquarters.

Both the NRC and DOE have a voluntary mediation program for resolving concerns or allegations.

The following table summarizes concerns or allegations filed with the Department of Energy and the Nuclear Regulatory Commission at the Hanford site and at Energy Northwest. Based on this information, it appears as though workers are less able to successfully resolve their concerns within their own organizations at the Department of Energy site than at the commercial generating site.

Table 4.3: Comparison of “Allegations” and “Employee Concerns” filed with Regulators

	<i>2009</i>	<i>2010</i>	<i>2011</i>
Allegations made to NRC by Energy Northwest employees (n = 1,100)			
<i>Total</i>	<u>9</u>	<u>4</u>	<u>5</u>
<i>Total as a percent of workforce</i>	0.82%	0.36%	0.45%
Employee Concerns filed by Hanford employees to DOE (n = 11,000)	<i>2009</i>	<i>2010</i>	<i>2011</i>
<i>Total</i>	213	222	340
<i>Total as a percent of workforce</i>	1.94%	2.02%	3.09%

Source: Data on “Allegations” gathered from NRC website on allegation statistics, and “Employee Concerns” information presented to the Hanford Advisory Board

Formal claims filed with the Department of Labor

How do the survey, concerns and allegation statistics correspond with formal claims of reprisals for raising concerns? The following table shows that although workers at the Department of Energy site generally had more negative views of their “safety culture” according to surveys, and raised more concerns with the regulator, they were slightly less likely to file a formal complaint with the Department of Labor.

Table 4.4: Comparison of formal whistleblower claims filed with the Department of Labor by employees in organizations regulated by the Nuclear Regulatory Commission and Department of Energy

Whistleblower claims filed with DOL by employees of NRC regulated Energy Northwest (n = 1,100)	2009	2010	2011
<i>Total</i>	<u>0</u>	<u>2</u>	<u>2</u>
<i>Total as a percent of workforce</i>	0.00%	0.18%	0.18%
Whistleblower claims filed with DOL by employees of DOE contractors at Hanford (n = 11,000)	2009	2010	2011
AdvanceMed Hanford		1	
Bechtel National Inc.			1
Intermech			1
URS Corporation		1	1
Washington Closure Hanford (WCH)	1		
Washington River Protection Solutions (WRPS)	1	2	5
<i>Total</i>	<u>2</u>	<u>4</u>	<u>8</u>
<i>Total as a percent of workforce</i>	0.02%	0.04%	0.07%

Source: Data summarized from a Freedom of Information Act Request to the Department of Labor filed by the author and fulfilled on May 9, 2012

Perhaps most striking is the comparison of the data from the Hanford site with national data. The following table shows that employees at NRC regulated sites were far more likely to file a formal whistleblower complaint than were employees at Department of Energy sites. Also of note, it appears as though workers at the Department of Energy's Hanford site were more likely than workers at other DOE sites to file a formal whistleblower complaint, while workers at Energy Northwest filed fewer formal complaints than their counterparts at other commercial sites.

Table 4.5: Formal whistleblower claims filed with the Department of Labor under provisions in the Energy Reorganization Act

<i>Formal Complaints filed with the DOL under the Energy Reorganization Act</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>
Employees of NRC regulated entities	28	29	38
Employees of DOE regulated entities	4	6	11
Employees of either/both	6	2	6
Employees of Government Agencies	5	1	5
Universities and Medical Centers	5	5	1
Other	2	0	1
<i>Total</i>	<i>50</i>	<i>43</i>	<i>62</i>

Source: Table derived from data obtained through a Freedom of Information Act Request to the Department of Labor filed by the author and fulfilled on May 9, 2012

A number of explanations may account for these differences. First, there may simply be more employees who work for entities regulated by the NRC than the DOE. The DOE operates a dozen sites and employs approximately 115,000 people directly or through contractors. The NRC regulates 104 power reactors at 65 different sites. In addition, the NRC also regulates entities that produce fuel for powering commercial generators. If each reactor employs 1,100 employees similar to Energy Northwest, the power generators alone would employ as many workers as the Department of Energy. But employees at commercial sites also include those working in fuel production, and the total number of workers in NRC regulated entities is likely much higher than the number of workers in DOE-regulated organizations.

Second, employees at NRC sites may be more actively engaged in raising concerns within their organizations due to the emphasis by NRC regulators, which in turn, creates an opportunity for retaliation. Evidence from interviews conducted for this study suggests that the NRC is widely viewed as creating a culture of safety in which dissent, conservatism, and a

questioning attitude are encouraged. By encouraging workers to raise concerns with regulators through the prominent link on the web site, and the presence of on-site inspectors, the NRC signals to employees that it doesn't want them to remain silent in the face of serious concerns.

A third and related reason may be that workers at NRC regulated sites are more aware of their rights to raise concerns, and more readily file formal complains with the Department of Labor if they perceive they have been the target of reprisals for raising safety concerns. Similarly, workers at Department of Energy sites may not receive positive feedback (or any feedback at all) when raising concerns with the DOE, which may discourage them from pursuing the concern within their workplace or filing a formal whistleblower claim.

Overall, these findings support the thesis that regulators shape the impact of laws through the formal and informal signals they send to individual workers. The NRC appears to encourage more workers to raise concerns in the workplace, while workers at DOE sites are more likely to remain silent. Because commercial operators have the sense that the fate of their individual reactor is linked to the safety and success of other reactors, these organizations may work harder to encourage workers to raise safety concerns. Workers in DOE-regulated entities at Hanford may be more likely to raise concerns because of the robust media coverage of Hanford issues compared with other defense sites. These data suggest that the regulatory agencies and regulated entities are influenced by their organizational environments, and that their actions in turn shape perceptions of the individuals within them.

Conclusion: Regulatory agencies influence organizational perceptions and legal practice

The findings outlined in this chapter suggest that regulatory agencies influence workers' willingness to raise concerns. Unfortunately, these data also suggest that real or perceived

reprisals still occur at nuclear sites when a worker raises a concern about health, safety or the environment. This evidence alone cannot lead one to conclude that whistleblower protection laws are ineffective, or that agency implementation and enforcement brings about imperfect outcomes. Rather, it provides an opportunity to examine the ways in which regulatory agencies have successfully influenced organizational decision-making and actions, and where their efforts have fallen short.

Regulators at both the Department of Energy and the Nuclear Regulatory Commission have developed an approach that relies both on a system of incentives and penalties, as well as a more subtle, constitutive approach that seeks to affect the assumptions, beliefs, and norms within their regulated entities. For instance, agency oversight has resulted in the emergence of employee concerns programs, new policy directives regarding the treatment of dissent, contracting requirements, and rule-making that sanctions organizations for retaliating against workers. DOE contractors and NRC licensees must comply with required elements of a “safety conscious work environment” or face financial penalties, increased oversight, and non-renewal of contracts or licenses. Rule-making within the Nuclear Regulatory Commission defines a safety conscious work environment and makes retaliation an enforceable violation of NRC rules subject to investigation and civil penalties. These oversight strategies target aspects of the rational decision-making processes, prompting regulated organizations to comply in order to avoid negative financial consequences.

Both DOE and NRC have also taken measures to affect the less rational aspects of decision-making processes. One way has been to change the set of professional norms that has characterized the hierarchical, military history of the industry by encouraging individuals at all levels of the organization to raise concerns. A second method of influence has been to suggest

that any type of concern, no matter how seemingly insignificant, and regardless of who raised it, deserves examination. This creates a pattern of response by supervisors and senior management that overrides default decision criteria such as attributing motivations or dismissing the risk of highly unlikely events.

Finally, the NRC in particular has empowered individuals to report directly to regulators. Through a prominent link on their website's home page, and the presence of resident inspectors on site, the agency signals to workers a place where their concerns can be aired and resolved. These changes might be considered a less formal, more constitutive force that alters workers' expectations about the way they should be treated if they do raise concerns, and managers' understanding of their obligation to resolve concerns.

In that sense, whistleblower protection laws may in fact change the balance of power within organizations due to a "shadow of the law" effect on workplace relationships (Edelman 1992; Mnookin and Kornhauser 1978-1979). Similarly, these regulatory agencies have been influential in shaping the legal consciousness of individual workers through the formal and informal signals communicated by managers and co-workers (Silbey 2005). These signals become an important influence in decision-making and legal practice in regulated organizations. In the following chapter, I examine the ways in which regulatory oversight and other factors in the organization's environment converge and influence responses to internal dissent.

Chapter Five

POLICIES AND PROCESSES FOR RESOLVING CONCERNS

“Walt is killing us. Get him in your corporate office today.”

Bechtel’s Project Manager, Waste Treatment and Immobilization Plant in an internal e-mail to URS, a subcontractor on the project

Organizations at Hanford have responded to whistleblower protection laws and changing expectations in the external environment by creating internal processes for resolving concerns, adjudicating claims of retaliation, and emphasizing the importance of safe operations. As this legal right of workers or managers to stop work or raise concerns is incorporated within organizations at the site, it is most often framed within the narrative of “safety culture” and relies on best practices shared across the industry. These organizational responses are also intended to demonstrate compliance with whistleblower protections for the benefit of regulators, courts and stakeholders.

In many cases, these responses in the form of new policies and processes do encourage workers to raise concerns. However, these policies aren’t always explicitly communicated as formal, legal right to raise concerns within the organization without fear of retaliation, but rather part of a broader organizational effort to improve safety. This framing underemphasizes the transcendent power of law that policy-makers likely intended. Instead, the right and even obligation to raise concerns are framed as company policy, and the importance of safety and raising concerns can ebb and flow with changes in leadership, even at the level of middle management.

This chapter outlines the similarities and differences among the contractors and licensees at Hanford, and shows how each has adopted similar processes for resolving concerns based on pressures in the external environment, including new legal mandates, regulatory requirements,

and heightened political and media attention on issues of public safety following catastrophes at Three Mile Island and Chernobyl. Specifically, it describes the policies, processes and practices that have been adopted – many to good effect. On the other hand, this chapter also shows significant differences in how individuals perceive the value of dissent within their organization, despite similar processes for raising concerns. I theorize that stated policies and actual practices diverge in many cases, due in large part to the unique history and culture of the individual organizations. This chapter further emphasizes the importance of regulatory oversight and enforcement strategies in shaping organizational culture.

Profile of organizations in this study

As described in earlier chapters, this study includes five regulated entities at the Hanford site – one regulated by the NRC and four by the DOE. This section highlights the differences and similarities between these organizations, which range from a public agency to the largest privately held construction contractors in the world. Although each of these organizations has nearly identical processes for resolving concerns, I theorize that the differences in ownership, history are embedded within the everyday practices of the organization and ultimately affect how individuals perceive the value of dissent.

Table 5.1: Overview of licensees and contractor organizations

	NRC	DOE			
	Energy Northwest	Bechtel National Inc. (BNI)	Ch2M HILL Plateau Remediation Company (CHPRC)	Washington River Protection Solutions (WRPS)	Washington Closure Hanford (WCH)
Year established	1957	1977 (Parent Co, 1898)	2007 (Parent Co, 1946)	2007 (Parent Co, 1951)	2004 (Parent Cos, 1898, 1946, 1951)
Ownership	Public utility	Bechtel Group Inc. (privately held)	CH2M HILL Companies, (privately held, employee owned)	URS Corporation (publicly traded)	URS Corporation, Bechtel, CH2M HILL)
Headquarters	Richland, WA	Frederick, Maryland Parent Co: San Francisco, CA	Richland, WA Parent Co: Englewood, CO	Richland, WA Parent Co: San Francisco, CA	Richland, WA Parent Cos: San Francisco, CA, Englewood, CO
Number of employees	1,098	(Parent Co, 52,700)	(Parent Co, 26,000)	(Parent Co, 50,000)	(Parent Co, 50,000)
Core business	Public Power Generation	Engineering Services	Engineering services	Engineering Services	Remediation and environmental cleanup
Mission	Provide our public power members and regional ratepayers with safe, reliable and cost-effective power.	Getting the job done right the first time, protecting the environment and Columbia River from waste threats	Removing hazards away from the river and reducing Hanford's active area of cleanup to the site's Central Plateau.	Safe and efficient management, retrieval and treatment of Hanford's tank waste	Reducing hazards, safeguarding people and the environment

Source: Data compiled by author from Hoover's Business Directory and company websites

Energy Northwest

Energy Northwest is a municipal corporation that produces power at cost for its 28 member utility districts. It was established in 1957 by state law and originally named Washington Public Power Supply System (WPSSS). The agency came to be known as “Whoops” after it failed to construct four out of five of its planned nuclear power plants and defaulted on \$2.25 billion in municipal bonds – the second largest municipal bond default in U.S. history. The organization was renamed in 1998. For the fiscal year ending in 2013, Energy Northwest earned approximately \$569 million in revenues.

Governed by an executive board and board of directors, Energy Northwest is based in Richland. Its power generation facilities include Packwood Lake Hydroelectric Project, Columbia Generating Station, and Nine Canyon Wind Project, and White Bluffs Solar Station. Energy Northwest’s Columbia Generating Station is one of 104 nuclear power plants regulated by the Nuclear Regulatory Commission.

In 2013, the American Public Power Association named Energy Northwest as ranking first among operators of its size for safety. The mission of Energy Northwest is to “provide our public power members and regional ratepayers with safe, reliable and cost-effective power.” Its 2013 Annual Report emphasizes safety, reliability, and predictability, and celebrates a new record of nearly a year without an “OSHA” recordable accident. It’s website makes the overarching statement, “Public health and safety is the unwavering commitment for everything we do and is the overarching imperative of our mission, vision and strategic plan.”

CH2M HILL Plateau Remediation Company

CH2M HILL Plateau Remediation Company is a subsidiary of CH2M HILL Companies Ltd. Founded in 1946, CH2M HILL is an employee-owned company based in Englewood, Colorado. The company operates two business units; 1) Energy, water and facilities is the largest, and 2) Government, environment and infrastructure. The federal government is the company's largest client – accounting for 28% of revenue in 2012. U.S. operations account for two thirds of the company's revenues, which in 2013, totaled approximately \$6.2 billion. In 2013, CH2M HILL ranked #57 in Forbes largest privately held companies, and #415 on Fortune 500 list. In 2009, it was ranked by Forbes as one of the top 100 companies to work for in the U.S.

The company was founded by four alumni of Oregon State University's engineering program following World War II. The company's first major project was a wastewater treatment facility at Lake Tahoe – the first of a kind – that earned the company acclaim in the *Reader's Digest* and *Wall Street Journal*. With a reputation for water and wastewater treatment, CH2M HILL earned its first contract under the newly created Superfund program in 1982. This foray into hazardous and toxic site cleanup demanded new technologies and expertise and created both challenges and opportunities for the company.

In 1995, CH2M HILL partnered with another company in to cleanup the Department of Energy's Rocky Flats site near Denver. A subsidiary CH2M HILL Hanford Group bought out Lockheed Martin Hanford Group in 1999 and took over the contract to manage and retrieve waste at Hanford's tank farms. In 2008, CH2M HILL was unsuccessful in its bid to renew its tank farm contract, but its plateau remediation subsidiary did win a contract to treat Hanford's groundwater at the site's central plateau.

CH2M HILL has expanded rapidly since the mid-1990s, when it employed approximately 6,000 workers and earned approximately \$1 billion in revenues. Since then, the firm has grown to 26,000 employees through expanded projects and acquisitions. The company's web site notes the following about its culture: "Founded in 1946 in the Pacific Northwest as a water project engineering company, the CH2M HILL culture remains firmly rooted in its focus on people through employee ownership, worker involvement, and protection of natural resources, from ensuring clean drinking water around the world to remediating groundwater in the Columbia River."

CH2M HILL's website says the following about its policies and values regarding safety: "Health. Safety. Environment. These are the pillars of Target Zero, our comprehensive operational and educational program that spans all CH2M HILL projects and offices. Target Zero is about a safe work environment, fostering a 24/7 culture of safe behavior, and a continual drive towards no adverse environmental impact. It also extends to security and asset protection, ensuring that staff, project sites, and client and company information and properties are properly safeguarded."

Washington River Protection Solutions

WRPS is a limited liability company established in 2007 and owned by a subsidiary of URS Corporation. Established in 1951, URS is based in San Francisco, California. URS has a network of offices in nearly 50 countries and more than 50,000 employees. Originally focused on physical sciences and engineering services, URS now provides construction and engineering services for the oil and gas industry, power and industrial projects, and infrastructure for federal, state and local governments. Growth of the company over the past few decades has come from

expanded projects as well as acquisitions of firms with expertise in engineering, design, and maintenance services. In 2013, URS earned \$11 billion in revenues and was ranked #248 among Fortune 500 companies.

Projects related to infrastructure and environment account for more than a third of the business, including highways, marinas, seawalls, correctional facilities and sports centers. Federal contracts and construction each account for about 25% of revenues. Federal contracts include projects related to decommissioning weapons, and nuclear plant remediation and decommissioning. Construction projects include modification, and decommissioning of oil and gas facilities, research labs, and manufacturing facilities. The company's two largest customers are the U.S. Army and U.S. Department of Energy.

In 1957, URS won its first major contract with the U.S. Army, lasting until 1971. In part, the contract was to develop logistical and personnel training systems. Originally United Research Services, its name was later shortened to URS. The company went public in 1976, and in the following decade, faced financial challenges as a result of lower infrastructure spending during the Reagan administration. During the mid-1990s, URS made acquisitions that added to its transportation and environmental capacities. In 2002, URS acquired EG&G Technical Services, which provided technical and support services to the Department of Defense and Department of Homeland Security, making URS one of the largest federal service contractors.

URS Corporation has provided technical management and construction services for the commercial nuclear power industry for sixty years. It's website claims to have accomplished thousands of technical services tasks and life-extension modifications for more than 100 operating units worldwide. The company claims to be "the largest environmental management contractor to the U.S. Department of Energy" managing "the cleanup of radioactive waste at

former nuclear production sites.” In addition, “a URS-led consortium manages the operations and cleanup of the Sellafield nuclear complex (United Kingdom), one of the world’s largest nuclear sites, for the Nuclear Decommissioning Authority.”

In 2008, URS subsidiary WRPS won the contract to manage and retrieve high-level nuclear waste at the Hanford Nuclear Site. WRPS’ website outlines its mission as follows: “Washington River Protection Solutions (WRPS) is committed to the safe and efficient management, retrieval and treatment of Hanford’s radioactive and hazardous tank waste, which poses a threat to the nearby Columbia River.” URS also performs work on the vitrification plant as a subcontractor to Bechtel.

URS Corporation notes on its website that it is committed to incorporating best practices for safety culture as well as creating them. It emphasizes URS’ commitment to ethics, compliance, and a policy of non-retaliation for employees who “report concerns in good faith.”

- “Our focus on ethics and compliance begins with active leadership from our executives and is reinforced at every level across our operations and regions.”
- “Our ethics and compliance processes and procedures are designed to prevent, identify, and resolve any potential ethical concerns, and include training and communications, monitoring and auditing, enforcement and discipline, and response and prevention. Our processes are supported by a team of professionals, led by URS’ Compliance Officer and General Counsel.”
- “The URS Ethics Hotline is available to employees, customers, subcontractors, and vendors to report potential violations of our Code of Business Conduct and Ethics standards. URS follows up on all reports to the extent possible and strives to address concerns fairly and in a timely manner. Our non-retaliation policy protects employees who report concerns in good faith.”

Washington Closure Hanford

Washington Closure Hanford is a limited liability company owned by jointly by URS Corporation, Bechtel and CH2M HILL. Established in 2004, WCH manages the \$2.3 billion

contract to clean up Hanford's 555 waste sites, demolish 329 buildings, secure two reactors for interim safe storage, and operate the Environmental Restoration Disposal Facility. WCH's website states that it's mission is to "Remove the environmental risk and hazards near the Columbia River Corridor through efficient, safe and compliant procedures while safeguarding people and the environment.

Regarding company policies for health and safety, WCH's website states, "The primary goal of the Health and Safety program is to ensure Washington Closure Hanford and subcontractor employees go home injury-free and in the same condition in which they arrived." WCH notes that in 2009, it received "star status" under the U.S. Department of Energy's Volunteer Protection Program). Star status recognizes the highest degree of safety excellence in the program as follows: "The Voluntary Protection Program (VPP) was established to promote the reduction of injuries and illnesses in the workplace through the cooperative efforts of management, labor and government. The program demonstrates that labor, management, and government can work together successfully as partners in excellence."

Bechtel National Inc.

Bechtel National is a subsidiary of Bechtel Group Inc., one of the oldest and largest family-owned companies in the United States. Founded in 1898 by Warren Bechtel, the company has completed 23,000 projects in 140 countries. As one of the country's largest construction companies, it is known for tackling complex "mega" projects beginning in 1931 with the Hoover Dam. The current chairman of the board is a fourth generation member of the Bechtel family. With approximately \$37 billion in revenues in 2012, the firm ranks #4 on the Forbes list of privately held companies.

Bechtel Group operates five global business units that specialize in 1) civil infrastructure, 2) power generation, communications and transmission, 3) mining and metals; 4) oil, gas, and chemicals; and 5) government services. Major projects have included the San Francisco and Washington DC subway systems, London's high-speed rail, and extinguishing fires in Kuwait after the war, and contracts to rebuild Iraq during the second gulf war in 2003. The company was also a partner in constructing Boston's tunnel known as the "Big Dig," a \$14.6 billion project controversial for its cost overruns and safety concerns.

Bechtel has been a major defense contractor for more than 50 years. During World War II, Bechtel built U.S. Navy bases and expanded airfields on 30 Pacific islands. Today, it provides expertise and services in the handling and destruction of nuclear waste material and chemical weapons. Specifically, it designs and manages fabrication, testing, installation and field support for nuclear power plant components used in submarines and aircraft carriers. In 1981, the company secured its first contract with the Department of Energy, and today works with or manages labs for the Department of Energy and National Nuclear Security Administration, providing expertise on the development of national security projects. Bechtel has also been involved with commercial nuclear plants, with contracts to clean up after the Three Mile Island accident in 1979, and decommissioning the Connecticut Yankee nuclear power plant after its closure in 1996.

In 2001, Bechtel National Inc. was granted a contract by the Department of Energy to construct the "vit plant" that would process and stabilize in the form of glass logs, the 56 million gallons of high-level waste at the Hanford site. Bechtel's website outlines its mission at Hanford on its web site: "Every worker on the WTP Project understands the importance of getting the job done right the first time. They are active members of the Tri-Cities community,

and they are committed to protecting the environment and the Columbia River from radioactive and chemical waste threats.”

Bechtel Group’s website outlines the following as the company’s values:

- **Ethics.** Uncompromising integrity, honesty, and fairness are at the heart of our company.
- **Excellence.** We set high standards. We apply advanced technology, and we continually innovate and improve. We thrive on challenge and accomplishment.
- **Fair Return.** We earn a return that fairly rewards the value we deliver.
- **Mutual Respect.** We work by our Bechtel Covenants, which encourage openness, teamwork, and trust. We value an inclusive culture based on diverse backgrounds, experience, and views.
- **Safety.** Zero accidents is our unwavering goal—people’s lives depend on it.
- **Sustainability.** We plan and act for the future—for the long-term good of our company, our customers, and our world.

Processes for resolving employee concerns

As outlined in earlier chapters, whistleblower protection for nuclear workers was first established by Congress in the Atomic Energy Act of 1974, and amended in 1978. However, those familiar with the history of the nuclear industry have argued that it was not this legislation, but accidents at Three Mile Island and Chernobyl that prompted organizations to incorporate formal processes for raising concerns (Institute of Nuclear Power Operations 2004).

In 1979, President Jimmy Carter established a commission to review the accident at Three Mile Island. As a result of recommendations outlined by the commission, the industry formed the Institute of Nuclear Power Operations (INPO) in December 1979. The non-profit entity centers its activities on four cornerstones: 1) plant evaluations, 2) training and accreditation, 3) events analysis and information exchange, and 4) assistance. Based on interviews with representatives at the NRC and at the commercial operator Energy Northwest,

INPO has played a significant role in establishing new processes for raising concerns in nuclear organizations.

Following the meltdown of the reactor at Chernobyl, nuclear experts identified some of the same failures that led to the partial meltdown at Three Mile Island. These failures included technical aspects of the hardware, but also procedures, training, and attitudes toward safety. Together, these two accidents prompted the nuclear industry to focus on what would come to be known as “safety culture.” The International Nuclear Safety Advisory Group defined safety culture as “that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance” (Nuclear Energy Institute 2003, A1).

Another definition of safety culture proposed by INPO emphasizes the importance of organizational leadership, stating, “An organization’s values and behaviors-modeled by its leaders and internalized by members-that serve to make nuclear safety the overriding priority” (Institute of Nuclear Power Operations 2004, v). INPO suggests that safety culture is a “collective responsibility” including “members of an organization’s board of directors to the individual contributor.” As an industry organization, INPO has helped to foster the belief that “culture is a key ingredient in the overall success of the plant” (Institute of Nuclear Power Operations 2004, iv).

Institutionalizing safety culture

Many who were interviewed for this study emphasized the role that INPO and the NRC together played in changing the culture of commercial power operators. Many interviewed for this study emphasized the concept of a linked fate, where an accident by any one plant could

mean the end of operations for all 104 reactors in the United States. INPO helped to establish the concept of a Safety Conscious Work Environment (SCWE) “as the freedom to raise concerns without fear of retaliation is but one (albeit important) element of a strong nuclear safety culture” (Institute of Nuclear Power Operations 2004, vii).

SCWE was later defined in a policy statement by the NRC (Nuclear Regulatory Commission 1996) providing the basis for rule adoption that makes retaliation an enforceable action by the regulator. Adopting best practices for a safety culture, and establishing processes for resolving concerns has the added benefit to organizations of demonstrating compliance with whistleblower protection laws to regulators and the courts. INPO provides assistance to operators by suggesting elements of a Safety Conscious Work Environment, suggesting best practices as follows:

- A policy statement from senior management that includes:
 - The foundation and necessary elements of free and open communications among all levels of management and work force
 - The company’s open-door policy to receive concerns
 - The individual’s workplace right to participate in protected activities
 - The freedom of any individual to raise concerns to external entities
 - The existence and purpose of the primary and alternative methods of reporting deficiencies or raising concerns (Nuclear Energy Institute 2003, B1)

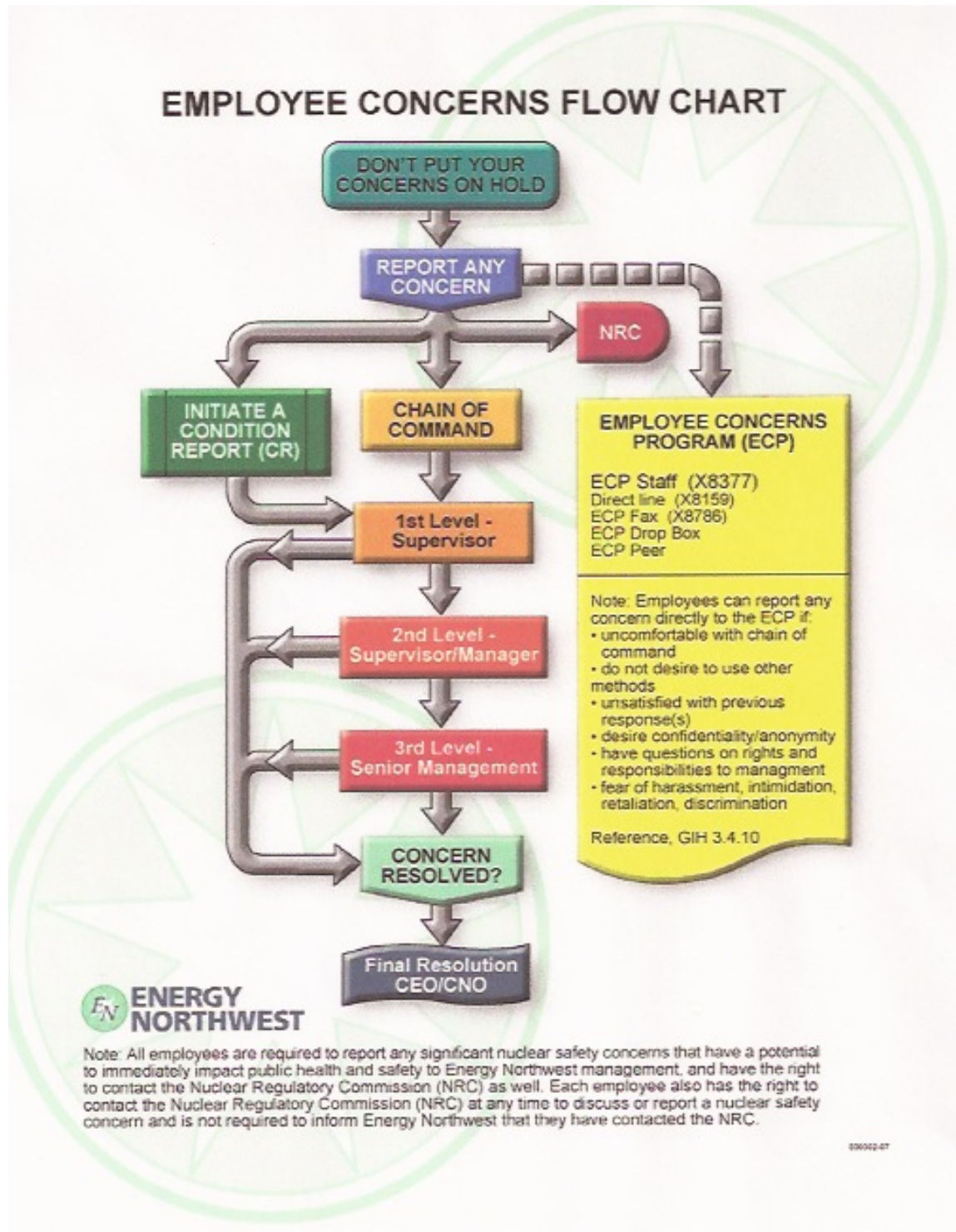
- An Employee Concerns Program with the following principles:
 - Separate from other programs (including HR Departments)
 - Independent from line management
 - Administered by Competent Personnel
 - Ensures appropriate levels of confidentiality
 - Designed to address concerns with a defined scope
 - Empowered to assign priority to, and responsible for resolution of issues
 - Authorized to initiate investigations or reviews

- Accountable for providing feedback
- Subject to self-assessment and independent review
- Responsible for identifying and reporting trends
- Required to document trends
- Receptive to concerns from all personnel
- Maintain a visible presence within the organization (Nuclear Energy Institute 2003, C1-C3)

Employee Concerns Programs

Commercial operators are not required by the NRC to establish Employee Concerns Programs (ECP), but are strongly encouraged to do so as part of an effort to foster a safety culture and demonstrate compliance with whistleblower protection laws within their organizations. These programs are not intended to supplant resolution of concerns through an employee's chain of command, but to provide an alternative. Similarly, these programs don't preclude an employee from contacting the NRC directly. However, operators don't want to be seen by the regulator as unable to resolve concerns internally, so they have an incentive to establish and effectively operate these programs (personal interview, June 21, 2011). Energy Northwest, the one organization within this study that is regulated by the NRC, has an established Employee Concerns Program. The following diagram summarizes the process for raising and resolving a concern.

Figure 5.1: Process for resolving concerns filed with the Employee Concerns Program at Energy Northwest



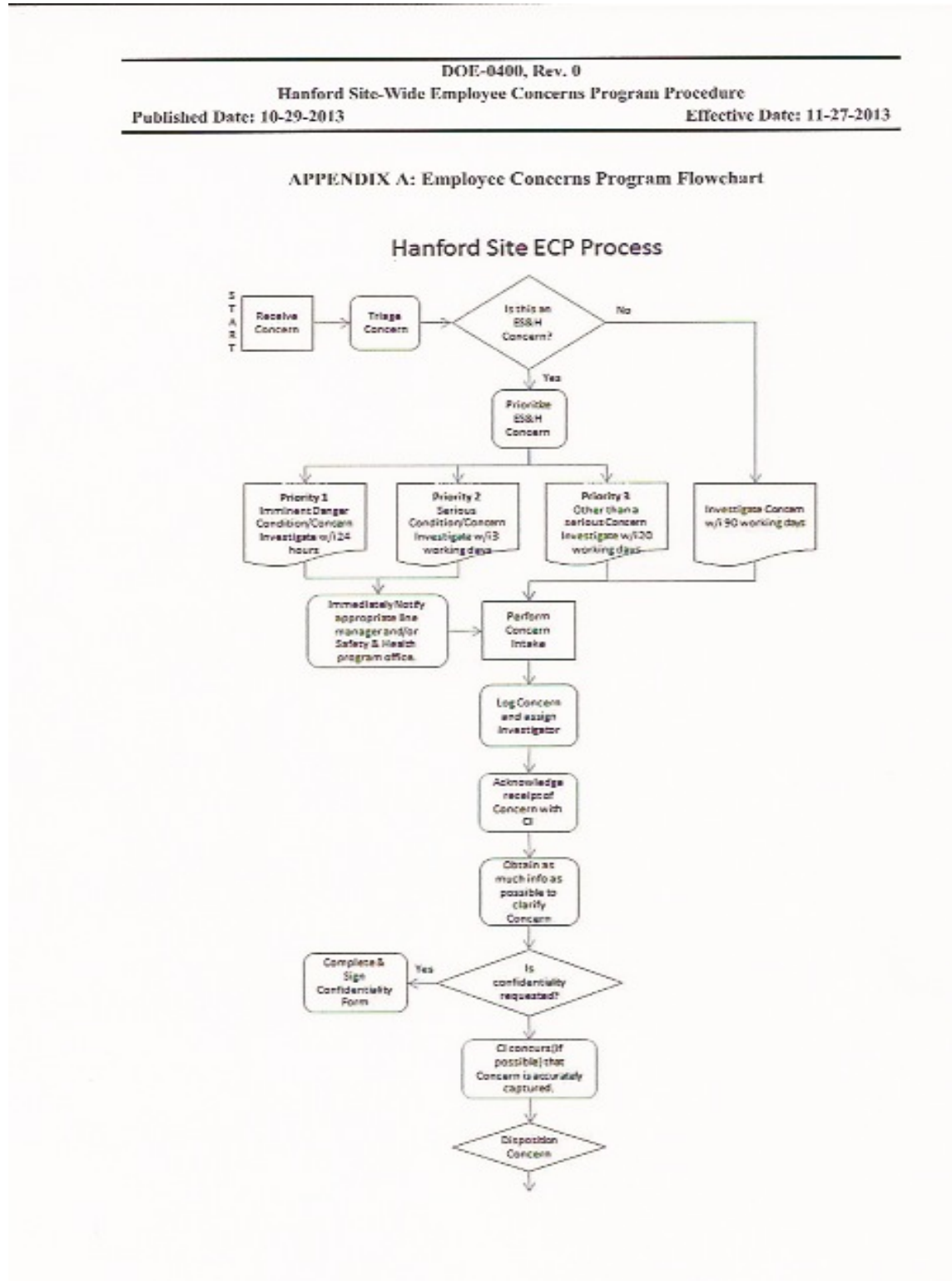
Source: Flow chart provided to author during field interviews

The National Association of Employee Concerns Professionals is another organization that has contributed to the spread of these programs at both defense and commercial nuclear sites. It began in 1988 with eight commercial nuclear operators, working in collaboration with INPO and the NRC. The organization now has over 200 members including representatives of Department of Energy sites, and more recently, the petroleum industry. This organization has been responsible, in part, for adoption of Employee Concerns Programs at DOE sites.

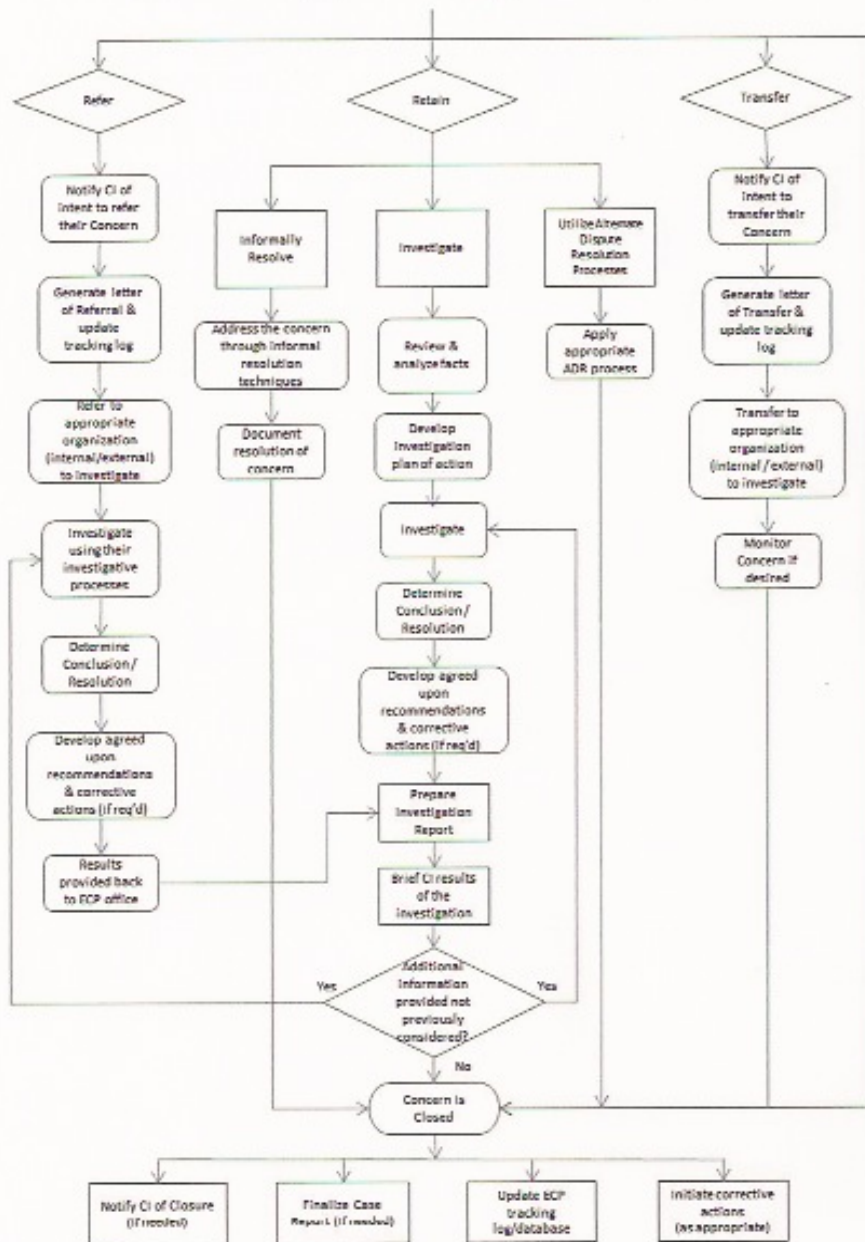
Whistleblower protections under the Energy Reorganization Act have applied to workers at commercial nuclear sites since 1974. However, whistleblower protections under this Act and other environmental laws did not apply to workers at defense sites, including Hanford, until 1992. Only after the mission changed from weapons production to cleanup did statutory protections against retaliation extended to employees of contractors and subcontractors at DOE sites (Garde 2000, 4). In 1999, DOE issued an administrative order instructing their sites to establish ECPs in order “to safeguard the free and open expression of DOE employee concerns” (DOE Order 442.1, February 1, 1999).

At DOE sites, the ECP’s primary responsibility is to make sure that all DOE contractor employees are advised that DOE management has zero tolerance for ‘all reprisals against or intimidation of employees who have reported concerns’ (Garde 2000, 4). In addition to the ECPs established at DOE sites, many of the contractor organizations also establish their own ECP. The following depicts the DOE ECP process for resolving issues raised by a “concerned individual” at the Hanford site:

Figure 5.2: Process for resolving concerns filed with the Employee Concerns Program at the Hanford Site



APPENDIX A: Employee Concerns Program Flowchart (cont'd)



Source: Department of Energy. 2013. *Hanford Site-Wide Employee Concerns Program Procedure*. Assistant Secretary for Environmental Management. DOE-0400.

The diagram of the DOE ECP process is clearly more complex than the process at Energy Northwest. Workers interviewed for this study expressed concerns about the confidentiality of the DOE process, noting that DOE often goes directly to the line manager without protecting confidentiality of the concerned individual. In addition, the DOE ECP manager often refers the concern to the contractor's ECP manager, further compromising the concerned individual's confidentiality and blurring the lines between regulator and contractor. This referral process is perhaps emblematic of the much closer relationship between the regulator and regulated entity at DOE sites than at commercial sites.

Differing Professional Opinion

Another opportunity for raising concerns at DOE sites is the process known as Differing Professional Opinion (DPO). Deputy Energy Secretary Daniel Poneman revised a previously issued order in 2011, clarifying the process for resolving “an opinion involving a technical issue related to ES&H (Environmental, Safety and Health) that (1) differs from previous management decisions, stated positions, or established policies or practices; (2) in the opinion of the employee, has not been adequately considered; and (3) if not addressed, has a reasonable probability of having significant negative impact with respect to environment, safety, or health” (Department of Energy 2011, 5). The process for resolving these kinds of concerns is similar to the Employee Concerns Program, but is intended to deal with issues greater complexity.

Hanford Concerns Council

The Hanford site also has a forum for resolving concerns that is unique among DOE sites. The Hanford Concerns Council (HCC) is a nonprofit organization sponsored by the Department of

Energy that resolves issues at the site related to health, safety or the environment. Unlike other processes, the council is comprised of employee advocates and neutral members as well as contractor management. Contractors at the site are not required to participate, but those that do, sign a memorandum of understanding agreeing to implement any consensus resolution reached by council members. Three of the four DOE contractors included in this study participate in the Hanford Concerns Council.

Unions

Unions represent workers at both Energy Northwest and the DOE contractors. At Energy Northwest, the International Brotherhood of Electrical Workers collectively bargains for workers, although other unions are represented such as the United Steel Worker's Union. At DOE sites, the Hanford Atomic Metal Trades Council (HAMTC) is the collective bargaining agent for workers. HAMTC is an umbrella organization representing fifteen different unions including the International Brotherhood of Electrical Workers, Plumbers and Pipefitters, and United Steel Workers. Unions also provide a means of resolving concerns about safety issues, as well as grievance procedures for retaliatory actions.

Quality Assurance and Corrective Action

The Nuclear Regulatory Commission promulgated rules under § 72.1 that requires internal inspections, audits, and processes for taking action to “ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances, are promptly identified and corrected.” The Department of Energy issued a guide for its contractors to develop and implement corrective action programs

(DOE G 414.1-5, 2006). Similarly, DOE offers guidance for contractors to achieve a DOE policy of Integrated Safety Management (ISM). The purpose of ISM, as described in the guide, is to “integrate safety into management and work practices at all levels, addressing all types of work and all types of hazards to ensure safety for workers, the public, and the environment” () (DOE G 450.4-1C, updated 2011).

Job Planning

Each of the processes described above are intended to address concerns that can’t be resolved through normal daily communications and activities between workers, managers and colleagues. Each organization has some version of hazard analysis and job planning that includes representatives from each of the “crafts” involved in a particular job, as well as management, and union stewards. Every organization included in this study works to train managers to be responsive to concerns, and emphasizes the importance of safety in pre-job briefings.

Each of these regulations, policies, guides, programs and processes serve as a checkpoint for members of the organization to raise a concern about safety. Yet, despite these abundant opportunities, workers may still feel their concerns or dissenting views aren’t welcome based on the formal responses by those in positions of greater power, informal responses by line managers and colleagues, and stories shared among workers. The following example shows how one organization in this study responded to concerns raised by a manager whose job it was to ensure quality and safety. This example sets the stage for discussion of individual insights gained from interviews at the site. Together, these provide a window into organizational life and the power of organizations to shape the reach and impact of law.

Walt Tamosaitis and the Waste Treatment Plant

On July 2, 2010, Dr. Walter Tamosaitis arrived at the Hanford site to attend the morning's first meeting. As the Research and Technology manager for the Waste Treatment Plant (WTP, also known as the "vit plant"), he was employed by URS Corporation, a subcontractor to Bechtel National Inc. Tamosaitis was responsible for working with a team of contractors, scientists, consultants, and government regulators to design and build a plant using first-of-a-kind technologies. Planning for the plant began in the mid 1990s, and was projected to cost \$5 billion and take 7 years to complete. By 2010, construction on the plant was 60% complete, but the estimated cost was \$12 billion and startup was another decade out. Perhaps most concerning, technical challenges in the design of the plant had not been fully resolved.

The Waste Treatment Plant is the centerpiece of cleanup at the Hanford nuclear site. The goal for its design and construction is to process the 56 million gallons of high-level radioactive waste, now stored in leaking tanks at the Hanford site, into glass logs. The process known as "vitrification," or converting waste into a more stable form of glass logs for long-term storage, is projected to take 40 years to complete. With an estimated \$2 billion in annual cost to operate, the total cost of building and operating the plant will exceed \$100 billion taxpayer dollars. After an investigation and report issued by the GAO about cost overruns on the project (Government Accountability Office 2006) Dr. Tamosaitis had worked with a team to identify and resolve remaining technical challenges to completing the project. In that sense, working with others to identify, raise and resolve concerns was part of his job.

So, on that July morning in 2010, he was taken aback when he was met by the Operations Manager and told that he needed to hand over his badge, company phone and company Blackberry. He wasn't being fired, exactly, but Dr. Tamosaitis was told he would no longer be

working on the WTP project. He needed to leave the site immediately. When asked what this was about, the Operations Manager told him to call the URS office overseeing the WTP project in Aiken, South Carolina. Tamosaitis was then shown the door.

Tamosaitis soon learned the cause of his dismissal from the project. The concerns he had raised about the impending “closure” of unresolved technical issues were a part of a larger effort by contractors Bechtel and URS to contain dissent and frame the message to regulators and elected officials that WTP was on track. Dr. Tamosaitis had not been the only one to raise concerns internally about the integrity of the plant’s design. Other scientists and a Department of Energy official had also suggested that a series of fundamental flaws could lead to a hydrogen explosion or criticality in the plant. While the probability of these events was low, Tamosaitis said, marginal design features that may work individually could together create a catastrophic failure. The consequences of failure could be irreparable damage to the Waste Treatment Plant, serious or fatal consequences for workers, and widespread contamination of the site, surrounding communities, and perhaps the region.

As a society, the concerns Dr. Tamosaitis raised with his colleagues appear to be just the kind of action one would hope a technically trained person in a position of authority would take. This situation offers a rare view into organizational responses to concerns he raised within his work group and labs. Dr. Tamosaitis ultimately aired his concerns outside the organization once he was removed from the project and filed a claim of retaliation with the Department of Labor. As a result, internal e-mails and memos have been released through the discovery process. I reviewed these documents for this study, which allowed me to retrace actions that individuals within the organization took in response to the serious concerns Dr. Tamosaitis raised about the viability and safety of the multi-billion dollar project.

The conflict was over significant process safety considerations between scientists designing the one-of-a-kind plant and the engineers who would build it – perhaps not unlike the conflicts between the scientists and engineers who built the first reactor at the Hanford Site nearly sixty years prior. Although others had raised concerns within the contractor organization and DOE before, the internal correspondence in this case shows that increasing pressures for production, performance and continued funding from Congress influenced organizational responses to these concerns.

There are a significant number of internal communications released by Bechtel as part of the discovery in a legal case involving Walt Tamosaitis, which were provided to me during field interviews. I have summarized some key pieces in this study, beginning with an e-mail from Frank Russo, the WTP project manager for Bechtel National Inc., to Ines Triay at DOE Headquarters. In his e-mail, Russo described a meeting he had with project scientists earlier in the day. On March 31, 2010, Russo wrote:

“It was like herding cats. Scientists that were diametrically opposed at the beginning of the meeting were in lock step harmony when we told them the science is ending. They all hated it! By the end of the meeting my guys were on board and Guy [Guy Girard, Federal Project Director the local DOE office in Richland] was on board but some of his direct reports remain cynical. Tomorrow I will remind ORP [Office of River Protection, DOE’s local office in Richland] and my folks and will do the same Thursday. Guy will keep ORP and DOE consultants in line, I will help and I will send anyone on my team home if they demonstrate an unwillingness or inability to fulfill my direction.”

Although Bechtel and its subcontractor URS have stated priorities for safety and getting a project done right the first time, Russo’s actions certainly did not seem conducive to furthering these priorities or fostering a safety culture. Despite the formal policies and processes for resolving concerns, his admonition that anyone who continued to raise concerns would be sent

home must certainly have sent a strong and palpable signal to personnel that dissent would not be welcome or tolerated.

As Frank Russo was declaring an end to the science, the director of the Pacific Northwest National Lab (PNNL) sent an e-mail to his counterparts at other labs around the country. On April 6, 2010, PNNL Director Mike Kluse wrote, “You are likely aware that the construction of the Waste Treatment Plant (the Vitrification Plant) on the Hanford Site is facing a number of project management and technical challenges.” He noted that one of his staff had been contacted by DOE headquarters, and that DOE would likely be seeking “capabilities and talent” from labs around the country to review and help resolve some of the technical challenges of the WTP project.

The following day, Frank Russo forwarded a copy of Mike Kluse’s e-mail (that had been forwarded to him from one of the labs) to Ines Triay at DOE Headquarters. On April 7, 2010 Russo wrote:

“Ines, Please see below: I am using this one piece of communication as an example of activities and actions that may be taking us in directions that we don’t want to go.

I think it important that I meet with Dan Poneman and/or Secretary Chu [Deputy Secretary and Secretary of the Department of Energy] as soon as their schedules allow. I am getting feedback from around the country that their offices are making calls at all levels of labs, other sites, competitors, etc..... There is no great idea that another external team will bring in that we haven’t thought of or previously managed at another site and time. As long as we are partnered with you, our customer, there is nothing left in this job that can’t be solved in a timely and cost effective manner.”

This communication highlights the tension between DOE’s role as a regulator ensuring safety and compliance on the project, as well as the customer responsible for meeting cleanup deadlines. It appears as though the contractor is seeking to control the framing of technical issues, and to eliminate additional opportunities for dissenting opinions from other labs or

experts. While there is no particular employee yet being targeted for dissent, the situation seems to be ripe for just such a target. The following suggests that both the Department of Energy and Bechtel are putting pressure on URS as its subcontractor to show that all issues have been successfully resolved.

On April 17, 2010, William Gay, URS Assistant Project Director for Safety, Quality, and Operations sent an e-mail to three members of his team, describing a meeting he had earlier in the day with Guy Girard, DOE's Federal Project Director in Richland. He said Guy was pleased that they were moving at "WARP speed" on the issue of mixing high-level waste that would take place in the early stages of the vitrification process. However, the mixing issue, known as "M3" had been, and would continue to be from that point on, one of the most vexing technical challenges.

In a post-script to his e-mail, Gay noted,

"I have heard that 80% of the fee has now been attached to M3 closure on time. That makes it personal from a bonus standpoint for senior URS personnel. We need to nail this issue to the ground in mid May.

Walt [Tamosaitis], please set up a meeting and allow ample time. Please invite the right people.

We have lived this issue 7/24 since October 2, 2009. Time for the Team to take it to the House!"

On April 19, 2010, Guy Girard, Federal Project Director for DOE in Richland, issued a memo to Bechtel's Frank Russo advising "DOE's expectation is that the Contractor will solve the M3 Inadequate Mixing issue no later than June 30, 2010. M3 is the most critical technical issue remaining on the project, and its resolution is vital to the WTP project schedule." Girard advised that if the mixing issue was not "closed" by June 30, DOE could reduce by 80% the

award fee incentives totaling \$6.3 million for 2010. Nearly two months later, on June 17, 2010, Frank Russo wrote to two team members, reminding them, “Fee is in play in a big way.”

In the months following the issuance of the “fee” memo by DOE, Russo sought to bolster Bechtel’s position that all problems with the mixing issue were resolved, and closure was justified. He contacted Savannah River National Lab, seeking their endorsement of Bechtel’s design. In a number of e-mails, he made it clear that he wasn’t happy that PNNL hadn’t yet endorsed the design and that he intended to obtain that endorsement. On May 29, 2010, Russo sent an update to Dae Chung, in DOE’s Environmental Management division.

“.... I came by your office Wednesday afternoon but you were out. We have a path forward on M3. We will get SRNL [Savannah River National Lab] on board and Ogilvie [Bechtel Senior Vice President] will tell Wadsworth (CEO of Battelle) that after over [\$]200 mil to PNNL and Battelle they damn well better be on board.We also told DNFSB [Defense Nuclear Facilities Safety Board] that our M3 plan is defense in depth with heal dilute/extract as depth and cold commissioning as assurance. We will go see them before 6/30 to get Peter, Jack and Jessie. Will try for Brown and Joe as well [the five members of the DNFSB]. I think we can get enough acceptance, that we can close M3....”

As senior Bechtel management was seeking to secure support from members of the Defense Nuclear Facilities Safety Board and the labs, Walt Tamosaitis was working with PNNL on the issuance of technical reports in his role as Research and Technology Manager. He remained concerned that some of the mixing issues hadn’t been sufficiently resolved, and encouraged others at PNNL to issue reports even if they cast doubt on the current design.

On June 15, 2010, Richard Edwards of PNNL wrote Tamosaitis an e-mail saying, “This will need to be reviewed by the project prior to issue, this is especially important if we keep the recently added sections with opinions that I mentioned below.” Perhaps reflecting the pressure PNNL was facing to support Bechtel’s technical design, Edwards continued, “At this point I

don't have a reason to spend the money to review and issue it." Tamosaitis responded, "This sounds a bit like "I don't like what it says so I don't think it should be issued. Certainly that is not the message. That would not sit well with many."

On June 23, 2010, Walt Tamosaitis sent his supervisor at URS, William Gay, an e-mail outlining issues he believed had not yet been addressed. Gay responded, "Walt, this is quite a list you sent me of loose ends. I would appreciate it if you could come see me next week for two hours, and we can go down the list."

On June 30, 2010 Frank Russo sent a lengthy e-mail to members of the contractor and subcontractor organizations, and outside experts who had worked on the mixing issue, congratulating them for bringing it to closure. Russo wrote,

"M-3 team members and team mates....

Today is June 30th. A day of reckoning. I reckon you all did extraordinarily well.... Your achievement exceeds my expectation for where we would be on this date. And, I had very high expectations....."

In response to an e-mail from David Walker [president of Bechtel National Inc.] inquiring whether Bechtel had successfully closed the M3 issue, Russo replied in a June 30, 2010 e-mail,

"Short answer....we made the Newtonian [one of the two characterizations of fluid in the tank waste] milestone that was the basis of the 80/20. All signed off and blessed by DOE. Non -Newtonian was not part of the fee agreement and Dale and Shirley [DOE] are well aware of this. I also told them that a clear way to kill momentum within the project and with congress re funding would be to declare m3 as not complete...they got that as well. Dale's words to me today were....BNI has met it's M3 obligation, we (DOE) need some time to review and fully understand the non Newtonian risks. My guess is we get a favorable disposition on the 80/20 fee because we actually earned it. If not, I will personally raise bloody hell."

Scott Ogilvie also sent an e-mail to Walker and Russo on July 1, 2010, asking whether Bechtel missed the contractual deadline for earning the fee, Russo replied,

“Full approval yesterday would have only put the DNFSB in high gear. So, we are proceeding with design without holds and DOE issued a press release (I sent it to you yesterday) saying we submitted everything we had to submit and they were reviewing it.”

The response from Ogilvie [Senior Vice President at Bechtel Corporation], Russo’s superior was,

“Thanks.....so at least we have a decent fee argument.”

Russo responded to Ogilvie and Walker, providing an analysis of the pressures on DOE and the risks of losing funding from Congress for continued work on the WTP. Russo wrote,

“Yes...I already made the argument to Dale and Shirley [DOE] that they would be absolutely crazy to not accept that we are finished with M-3. Congress is just looking for a reason to put Hanford money in other States...our \$50 million is still in play. Declare failure and high probability that the \$50 mil goes away. \$50 mil goes away.....major peril and S1 is again running day to day management of WTP. Why would they want to do this??? Especially since we did in fact finish M3 as defined by EFRT. Shirley [DOE Richland office] agrees. I believe that Dale [DOE Federal Project Manager] does as well but rightfully wants to proceed with caution since he needs S2 agreement and we all need to keep DNFSB from overreaching.

That all said, I repeat, they are DOE....and they often do things that make no basic sense.”

The mood seemed to be changing from one of creating a sense of certainty and inevitability around closure of the technical issue, however. In an e-mail to DOE Project Manager for the vit plant, Dale Knutson, Russo expressed exasperation at the concerns Walt Tamosaitis continued to raise. On July 1, 2010, Russo wrote to Knutson,

“I just hung up with Kosson [Chair of Vanderbilt University’s Department of Civil and Environmental Engineering, and advisor to DOE]. He was not offended by my note to the team [thanking and congratulating them on the closure of the mixing issue]. In fact, he understood its purpose and expressed appreciation for how much things have changed since January. That said, he and I are livid about the string of e-mails Walt sent in the last 2 days. He is URS. I directed URS to get Walt out of here 2 weeks ago after meeting with Mike Kluse [PNNL]. Today I told Gay that Walt will no longer be paid by WTP. He did get an assignment at Sellafield [Great Britain] and leaves next week.

This guy had the whole M3 hosed up for a year. He was taken out of the lead role in January. It got done without him. His ego can’t accept that and he is lashing out.”

Russo’s response suggesting that Tamosaitis couldn’t accept change and was “lashing out” is typical. Based on interviews conducted for this study, those who raise serious concerns are often cast by management as emotional, unstable, or self-motivated. In this case, it is not surprising to see this response from Russo, given the multi-million dollar fee and continued funding from Congress at stake. It is also not surprising, given Bechtel’s ability to navigate the politics of major government jobs, and private ownership, that the company’s culture was one where the ends justify the means.

What is somewhat surprising is the response from the Federal Project Manager for DOE. Although his response to Russo suggests he is aware of the implications and attempts to be somewhat subtle and vague, the intent is clear – he has given tacit authority for Bechtel to pressure URS to remove Tamosaitis from the project. Knutson wrote,

“Frank, if this shows up in the press we will be sticking to our previous comment. Walt does not speak for DOE, nor does your appreciation note contradict the expectation that DOE will understand the residual risk and mitigation strategy before drawing its final conclusions. Deliberate haste will be our approach. Please use this message as you see fit to accelerate staffing changes or to “color” your conversations with Scott Ogilvie.”

On July 1, 2010, Frank Russo’s directive to William Gay of URS was clear,

“Walt is killing us. Get him in your corporate office today.”

Later that same day, William Gay replied with an equally terse message to Frank Russo, “...He will be gone tomorrow.”

When Tamosaitis was notified that he was no longer on the project and had to leave the premises on July 2, 2010, he began asking questions of senior executives at URS, seeking to understand what had gone on behind the scenes that caused his ouster. Evidence revealed later through discovery made it clear that DOE wanted him gone and advising that Tamosaitis would no longer be paid by DOE through Bechtel or its subcontractor. Further, DOE and Bechtel recognized Tamosaitis’ status as a potential “whistle-blower” but appeared not to consider that taking adverse action against him was a violation of law. On July 15, 2010, one staff member on the WTP project wrote to another,

“During a meeting with Bill Gay last Wednesday 7/8/10, Frank Russo came into Bill Gay’s office and told him that Walt Tamosaitis was not allowed back on the WTP project. Frank stated that he tried to work a different solution but discussed this with the Federal Project Director whose response was any costs incurred for Walt Tamosaitis would be considered unallowable [not reimbursed by DOE]. Frank stated, the Federal Project Director was not going to respond to threats of whistle blowing.”

Frank Russo continued to cover his bases at DOE, again attributing Tamosaitis’ actions to self-interest. On July 15, 2010, Frank Russo wrote to Ines Triay of DOE,

“Walt Tamosaitis (URS) had lost focus after we put Mike Robinson in charge of M3. Towards the end, he became disruptive and sent e-mails out that caused CRESA [DOE’s advisory panel] and others concern. I asked URS to transfer him and gave them a couple of months to do it. When he sent one email to (sic) many, I told URS that he had to leave because he was undermining M3. He left the project 6/30 but still remains a URS employee. He is very annoyed because he intended to retire off of the project. That was never an option. Heads up, he is now going to the differing professional opinion process to try to call into question the very work he led for several years.”

Triay responded, “Thanks Frank for the communication. I truly appreciate it.” Shirley Olinger of DOE’s Richland office, wrote to Frank asking if others knew of the possibility that Walt Tamosaitis and Don A [Alexander, DOE senior scientist] might pursue their concerns externally. She suggested getting another DOE official to help quell any concerns that Don Alexander might raise.

Although he was still being paid by URS, Tamosaitis was assigned to a basement office in another building. Frustrated and concerned that the project was moving forward despite serious unresolved technical issues, he decided to raise the issue with the Defense Nuclear Facilities safety Board (DNFSB). In its oversight role, the DNFSB could hold hearings and issue opinions and advice. If they agreed with Tamosaitis’ concerns, the weight of their expertise and access to members of Congress could spell trouble for progress and continued funding for the vit plant.

Apparently recognizing the potential implications, Bechtel National’s David Walker wrote to another senior Bechtel executive, Scott Ogilvie. Forwarding Ogilvie a copy of the letter Tamosaitis sent to the DNFSB, Walker wrote on July 27, 2010,

“This is the letter Tomasitis (sic) sent to DNFSB. It is alive and growing. DNFSB has allegedly ordered an investigation. This may not have been a well orchestrated separation – getting the details – and therefore this could be an unfortunately messy event.”

In response to an e-mail from Bechtel’s Scott Ogilvie asking whether Ines Triay had been briefed on the developments, Russo wrote on July 28, 2010,

“Yes, She, Poneman [DOE Deputy Secretary] and Dale [DOE Federal Project Manager for WTP] stated that they understand reason for Walt’s departure and support BNI management. They are not happy with URS handling.

But this could all change. DOE can't be seen as involved.”

On July 28, 2010, David Walker, president of Bechtel National Inc. sent an e-mail to Scott Ogilvie and Frank Russo,

“I talked with Ines [DOE Headquarters].... Her fundamental question (unanswered) is why/how did we handle WT's move/departure so poorly. What was communicated by whom to whom and what were we thinking. She believes from DK [likely Dale Knutson, DOE Federal Project Manager] feedback that we will manage through the technical issues and DNFSB investigation part satisfactorily although at cost of significant disruption/time etc. Need to be sure “Hill” gets covered and protect the \$50 million.”

Conclusion: the waste treatment plant and the politics of dissent

Walt Tamosaitis and the concerns he raised about the vit plant illustrate the forces that shape the politics of dissent and the power of organizations to determine the meaning and impact of law. First, Bechtel clearly acted based on a calculation about the attentiveness and interests of the public, media and elected officials. Without regard to legal obligations to protect those who raise concerns, Bechtel made every effort to quell dissent. Yet in the end, the concerns Tamosaitis raised have proven salient and received significant media attention in the *Tri-City Herald* and national newspapers such as the *LA Times* and the *USA Today*. The DNFSB has held hearings and validated the concerns that Tamosaitis raised. Congress has also held hearings about the plant as well as the adequacy of whistleblower protections.

Despite Bechtel's efforts to frame the technical issues as fully resolved for the regulator, labs, and media, the fact is that they remain unresolved. Bechtel managed to earn the fees they sought to secure in 2010, but quelling dissent has proven costly in the longer term. For a time, construction on the vit plant was halted as the DNFSB conducted its review. In 2012, Bechtel earned less than half the fees available under the contract. Carrie Meyer, a spokesman for DOE,

said the contractor's rating and level of payment "reflects the lack of closure on the path forward to address and correct issues" (Cary 2012). Bechtel had been right to assume the salience of the safety issues raised would garner attention and compromise their goals for productivity and profit. However, efforts to silence dissent has proven costly in the longer term.

A second layer of influence in Bechtel's response involved DOE oversight. As the model presented in this study posits, oversight plays a key role in organizational responses to legal requirements such as whistleblower protections. In this case, DOE was not just lenient but complicit in the actions Bechtel took against Tamosaitis. For its part, the DNFSB has less power as an oversight body than DOE, and Bechtel made every effort to frame the technical issues for the five-member board and gain their agreement. After the mixing issues became public, Congress considered, perhaps not coincidentally, a bill to dramatically cut funding for the DNFSB. With the DNFSB representing a relatively weak oversight body, and DOE facing its own pressures to show advancement on the waste treatment plant, Bechtel faced little pressure from regulators to comply with whistleblower protection laws.

Although Bechtel had similar policies and processes in place for resolving concerns, the informal responses proved powerful. Russo framed the technical issues and managed the relationships with others in positions of power. This included not just the regulators at DOE and DNFSB, but also the labs and outside experts. When Tamosaitis dissented from the prevailing view that the most challenging issues were resolved, Russo responded not to the concerns he was raising, but to his character. He reached out to every powerful actor that had a stake in his ability to earn revenue for his organization, and sought to define Tamosaitis' actions not as a legitimate technical disagreements and a legal right to raise them, but as subverting the goals of those in positions of power and authority.

Third, we can see the influence of the unique culture and histories of Bechtel and URS in their responses. One person interviewed for this study suggested that as one of the world's largest construction contractors, with a history of overseeing mega-projects for the government, Bechtel is used to wielding significant influence with Congress and regulatory agencies. Given its history, it has an infrastructure in place to lobby and influence opinions on Capitol Hill. URS, for its part, has grown significantly through acquisitions and lacks its own set of core values, according to one person interviewed. It both competes with, and serves as a partner and subcontractor to other major firms such as Bechtel. As a result, URS' default response is often to acquiesce to the needs and direction given by its partners, as it did in the case of Walt Tamosaitis.

Finally, individuals understand and perceive these layers of influence within and outside their organizations. Workers and managers interviewed for this study were thoughtful about the context in which they might raise a concern. Who would be responsive to it? What level of salience would it have and for whom? In addition, workers and managers recognized that dissent about significant process safety concerns that could compromise organizational goals for production and profit, such as those related to the integrity of the waste treatment plant, would be met with the greatest resistance. Perhaps most importantly, individuals interviewed for this study looked to the treatment of others who had raised concerns for a signal about how they might be treated.

The case of Walt Tamosaitis was widely known and discussed at the site when I conducted my interviews, and individuals described the "chilling effect" that had resulted site-wide. His case made it clear to many that DOE would be unwilling to respond to concerns that compromised their interests in meeting cleanup milestones. The stories shared among workers

and the informal signals are perhaps one of the most important ways in which organizations determine the impact and reach of whistleblower protection laws. Individual perceptions about the politics of dissent within one's organization are examined in detail in the next and final chapter of this study.

Chapter Six

IMPLICATIONS FOR WORKERS' WILLINGNESS TO SPEAK OUT

"Laws don't mean much just because you put them down on a piece of paper. People have to buy into them."

A Hanford Worker

Interviews with workers, managers and regulators provided meaningful insights into the ways in which beliefs come to be held and shared, the folklore that develops around those who raise concerns, and the informal cultures that sometimes bear little resemblance to the formal, stated policies of the organization. Through these interactions with workers, managers and union stewards at the site, I came to view an individual's understanding of a right to raise concerns within or outside the organization as far removed from the abstract, statutory law enacted by Congress. Instead, I found that perceptions and understandings about the value of dissent comes from within the organization, as well as from the perceived political and social pressures surrounding the organization.

Seeing organizations through the eyes of individuals working within them revealed the layers of influence that come to bear on a worker's decision about whether to raise concerns. Workers understood the layers of influence not in an interconnected or nested way, as the chapters in this dissertation might suggest. Rather, they experienced law as a thick mix of legal directives, meanings, incentives, risks, and potential punishments. This chapter explores the ways in which individuals in this study came to view the value of dissent within their organization at a given point in time.

I begin by returning to the case of Walter Tamosaitis, first examining how this situation came to a crisis point. But perhaps more importantly, seeking to understand why, given the high

stakes and cost, these serious concerns only came to light once construction of the plant was sixty percent complete. I draw upon the rich insights offered by those I interviewed to develop this understanding, and suggest that his case is not a unique or isolated event.

Second, I examine written worker surveys from each of the study organizations. Together with the insights gained from in-depth interviews, I piece together a picture of the value of dissent as perceived by individuals within each of the organizations.

Finally, I summarize the implications of this study. Rather than contemplating whether law and legal statutes have achieved stated goals, or whether organizations have complied with or evaded whistleblower protection laws, I propose the findings in this dissertation prompt analysis from another vantage point.

Years of silence

As part of this study, I interviewed a retired manager from the DOE office in Richland. He began the interview by first asking *me* a question – what did I think of the concerns Dr. Tamosaitis had been raising? The case had come up often during my interviews, which was not surprising given the media coverage, and hearings held by Congress and the DNFSB. I decided to turn the question back to my interviewee – what was his view of those concerns? Well, he said thoughtfully, he believed the concerns had merit. In fact, he said, he had raised the very same issues a decade ago within the DOE.

The problem, he explained, stemmed from the fact that each of the 177 underground tanks contains different kinds of waste, and the contents have never been fully characterized. Vitrification had worked at other sites, but those sites had more homogeneous waste to work with. During the plutonium production years at Hanford, workers had thrown everything from

beagle bones (the subject of radiation experiments) to rubber gloves in those tanks. The site historically had a single-minded focus on production, and managers figured they would worry about the waste later.

Those odds and ends would be relatively easy to sort and keep out of the mixers, he said. The problem would arise with larger particles, such as plutonium, which might enter the pulse jet mixers (these work similar to a giant turkey baster). If those particles clogged the jets, there would be no way to address the problem in a system designed to operate in a “black box.” In other words, a system that would remain inaccessible for the plant’s 40-year life. Further, incomplete mixing could lead to the kinds of catastrophic failures that Tamosaitis had identified.

There were other designs that, if adopted, could have avoided the mixing problem. For example, this retired DOE manager said, the process used at the Purex plant on site could have been used as a model for the vitrification plant. At Purex, workers had access to the equipment throughout the process in case a mechanical failure occurred, and could clear the line if it became clogged. Other mixing designs could also have avoided the potential for a significant problem, but the initial design by a British firm proposed the pulse jet mixers. DOE had changed contractors and the plant was now in its fourth iteration, but significant portions of the original design, such as the mixing system, remained part of the current design.

I asked what became of the concerns he raised a decade ago? Well, he said, he had raised them with his supervisor. Together, they arranged a meeting with Bechtel. His view was that the contractor had explained away the concerns, and that DOE had little power to demand more, given the contract provisions. Once a decision is made, he said, a prudent person leaves it at that. He then went on to explain what he meant by that.

In his view, DOE's hands are tied from a regulatory standpoint. With contract provisions that he understood precluded DOE from requiring any action that could reduce the contractor's profits, the agency's hands were tied. In addition, DOE didn't have the technical expertise to challenge the contractor's assertions. DOE's predecessor agency, the Atomic Energy Commission, was staffed with technical experts who had greater capacity for evaluating design and operational challenges. Unlike the old AEC, he said, DOE has little capacity or expertise relative to contractors in terms of collective knowledge and experience. Taken together, these factors suggest that individuals within DOE wield little power to effect change by raising concerns. In other words, the politics of dissent within DOE is likely to result in concerned individuals remaining silent.

The views of this retired manager were shared by another manager I interviewed, who had retired from DOE Headquarters. The former manager at HQ also mentioned the lack of expertise at DOE – expertise that had been lost when the old AEC was abolished. Now, DOE is comprised of staff largely responsible for administering contracts, not providing technical expertise or oversight. Although DOE is supposed to regulate safety, this former manager noted weakness in the Code of Federal Regulations that would allow for effective enforcement.

At DOE, he said, the contractor will go to the DOE and argue that 'if we have to comply, then it will take longer and cost more.' He mentioned what others had noted – that the relationship between regulator and contractor was one of co-dependency, fraught with conflicts of interest. His view was that regulating through contract clauses, without a public participation process, creates an atmosphere that discourages dissent.

Scaling up and standing down

Regarding the design of the plant, the former manager at DOE Headquarters said it was like this, ‘the system is now in the mindset of we decided to do it this way, and now all thinking just stops.’ DOE’s track record with glass melters didn’t inspire confidence, he noted, with eight melter-related accidents since 1991, two of which were steam explosions. Given the unpredictable nature of the waste at Hanford, he recommended back in the 1990s that contractors compete to design small-scale models, rather than move forward with the high-risk design-build approach that DOE ultimately adopted.

The Manhattan Project was a huge risk too, he noted. The science had been worked out, but not the engineering. He noted wryly that at least the Army Corps had the good sense to build a small-scale model first. As a member of the ‘front office’ at DOE, he held a certain amount of power to get people to listen, he said, and his office wouldn’t agree to build the ‘big kahuna’ without scaling up first. When the state of Washington ‘got wind’ of his advocacy for building a small scale model first, elected officials worried that such an approach would prolong the cleanup process and perhaps reduce the amount of federal funding coming into the site. He described what happened next – ‘the state called the Secretary of Energy who then called me into his office and asked me to stand down. I was a political appointee,’ he said, ‘so I stood down.’

Concerns are raised, but no action is taken

The original plan for developing the vitrification plant was privatization. Under this scheme, the DOE would transfer the risk – and reward – of building the plant to a private firm. No taxpayer dollars would be spent until the first glass log of vitrified waste was produced. Only then would the contractor be paid. The firm British Nuclear Fuels Limited (BNFL) was selected

for the job. Under this scenario, a private nuclear facility would have to be overseen by the Nuclear Regulatory Commission, which sent a team to Hanford to evaluate progress on the plant's design after BNFL was selected for the contract in the mid-1990s.

In a 2001 report, the NRC found that after three and a half years of oversight, two dozen significant safety issues related to the design of the plant remained unresolved. The NRC concluded that DOE contractors consistently downplayed the risk of a severe accident and estimated a 50-50 chance of a major chemical or radiological accident over the 28-year projected life of the plant (Alvarez 2005, 44). Citing escalating costs, DOE ended its contract with BNFL and Bechtel National became the prime contractor. Along with this change, DOE abandoned its privatization scheme and along with it, NRC oversight.

Observers have criticized the DOE's track record following NRC's departure in 2001. Rather than heed the warnings in NRC's closing report, DOE apparently allowed "programmatic demands to reduce cost and save time," which "led to relaxed safety requirements, higher construction costs, and increased worker exposures and injuries" (Alvarez 2005, 44). Other government entities also raised concerns. For example, the GAO cited DOE's "undocumented policy of blind faith in its contractors performance" as a contributing factor in DOE's cost overruns and failure to treat high-level waste at the Savannah River site" (Alvarez 2005, 46)

Further, the National Research Council found that the Department of Energy's "environmental projects suffer from major delays and are about 50 percent more expensive than comparable federal and private-sector projects." In addition, it found that DOE's "up-front project planning is inadequate," that there is "no consistent system for evaluating project risks," and that "DOE is not in control of many of its projects" (Alvarez 2005, 66). The Government Accountability Office criticized DOE's "fast track" approach "where design, construction, and

technology development occur simultaneously” as inadvisable for a first-of-a-kind complex nuclear plant (Government Accountability Office 2006).

While Congressional attention on the vit plant heightened and became increasingly negative, President Obama was elected and withdrew the government’s application for a nuclear waste depository at Yucca Mountain – the site destined to hold the most radioactive vitrified glass logs from the Hanford site. By 2010, when Walt Tamosaitis raised concerns internally about whether the technical concerns had been fully resolved, they emerged amid waning Congressional support for the plant and previously established plans for permanent disposal of the waste.

Given the political context, it is not surprising that the Department of Energy and Bechtel feared that Congress might pull funding for the vit plant. At worst, Congress might lose faith in DOE’s ability to oversee the cleanup and increase oversight of the agency. With increasingly negative media and Congressional attention on the vit plant, and a regulator uninterested in addressing Tamosaitis’ concerns, it is also not surprising that URS and Bechtel responded to Tamosaitis by taking measures to silence and discredit him.

From the perspective of URS and Bechtel, formal legal protections for workers who raise concerns was only one of many considerations in their decision-making. As the e-mail trail in the previous chapter indicates, Tamosaitis’s views weren’t a valid reflection of the work that had been done to resolve the technical and safety issues. His view of the technical challenges differed from the majority, and in their view, represented a disagreement among experts. Tamosaitis’ contacts with other experts outside the organization, represented not a good faith effort to bring about resolution, but in the view of URS and Bechtel, a breach of trust.

From the Department of Energy's perspective, their interests were aligned with Bechtel in demonstrating closure of the technical issue and forward progress on the vitrification plant. DOE managers were focused on the present political climate, including Congressional funding, particularly in the wake of recent debate over the permanent repository at Yucca Mountain where the vitrified waste was to be stored. At the same time, DOE managers were also likely influenced by a history of secrecy, where insider concerns were viewed as a threat to national security and the integrity of the project.

Together, DOE and its contractors viewed Dr. Tamosaitis and the concerns he raised not as an employee engaging in a legally protected activity, but a force that could amplify Congressional and media attention, awaken public suspicion of activities at Hanford, and perhaps even compromise support for the future development of nuclear energy.

In July 1, 2014, a state appeals court upheld the ruling of a Superior Court judge who had dismissed the case that Tamosaitis brought subsequent to his removal from work on the waste treatment plant. Tamosaitis continued to be paid after his removal, although he spent his working hours in a basement office with little meaningful work. In the fall of 2013, he was laid off. The court reasoned that Tamosaitis failed to show he had been harmed financially, or that he had missed opportunities for advancement at the waste treatment plant or elsewhere because his reputation had been sullied by the contractors' actions.

Dr. Tamosaitis still has a claim pending before the Department of Labor, which failed to conclude its investigation within a year. As a result, Tamosaitis brought a claim in federal court, which was dismissed before going to trial. That dismissal is currently under appeal. As the legal proceedings wend their way through the courts and the Department of Labor now four years later, Dr. Tamosaitis' life and that of his family, and his career have changed inexorably.

At the same time, construction on the vitrification plant remains at a standstill, pending further investigation into the safety concerns Tamosaitis raised. The mixing and criticality issues, and the potential for a hydrogen explosion, were later raised by another insider, who also has a claim pending before the Department of Labor. After an investigation and series of hearings, these concerns are now shared by members of the Defense Nuclear Facilities Safety Board.

From Tamosaitis' perspective, he surely feels vindicated by the validation of his claims. At the same time, he must acutely sense what others have described as a gap between his legal right to raise concerns without retaliation, and actual practice. His persistence in raising these serious safety concerns is just the kind of action we would hope someone in a position of authority would take when the potential consequences of failure are so high.

If policy-makers intended for insiders to participate in a broader governance structure, bringing pressure to bear on their organizations, Tamosaitis appears to be just the sort of actor envisioned in legal statutes. But Tamosaitis' case shows that insiders can only be effective participants in that boarder governance structure if they receive support from courts, regulatory agencies, the media and elected officials.

The view from inside

Workers at Hanford perform a number of tasks in a hazardous environment. The site's cleanup requires demolition of buildings used in various stages of the plutonium production process, and dismantling or "cocooning" old reactors until radiation levels have subsided enough to place them in long-term storage. It includes remediating groundwater, identifying old burial sites where radioactive material was placed - often without documentation - during the production years. At another location on site, workers are constructing the massive vitrification

plant. Some of the most hazardous work occurs in the tank farms, where workers transfer high-level chemical and radioactive waste out of leaking single-shell tanks to double-shell tanks.

At the site on any given day, thousands of workers are piecing together piping systems, welding together parts of the vitirification plant, building new structures, demolishing old ones, driving dump trucks, monitoring and tracking radiation doses, operating heavy machinery, and installing and monitoring complex groundwater pumping systems. These daily activities are carried out by thousands of workers employed by dozens of contractors and subcontractors. Although workers and managers undertake joint hazard analysis and job planning efforts, the nature of the tasks often presents unexpected hazards.

Working to dig up waste buried for decades, dismantling radioactive structures laden with beryllium and asbestos, and transferring waste that is largely uncharacterized, is fundamentally different than the kinds of routine work that takes place in other high-risk industries. Workers at commercial nuclear plants, including the Columbia Generating Plant located on a separate part of the site, generally work in a more predicable environment where nuclear reactions produce electricity. The exception to routine, predictable work is refueling outages, where the plant shuts down so that workers can remove spent fuel rods and replace them with new ones.

During my interviews at the site, I came to understand that workers and managers' understanding of the value of raising concerns is rooted in the daily work activities. At a site undertaking complex, unpredictable, hazardous work, an understanding of the value of dissent can change in different situations. This perception depends on the work tasks and activities, the contractor, messages from senior managers, and signals from immediate supervisors. It is a perception that is dynamic rather than constant, formed by a number of factors - both from

within and outside their organization - that overlap and converge to form that understanding. Workers interviewed for this study clearly articulated their understanding of whether safety concerns are welcome in their workplace, and provided thoughtful analysis about the factors that influence their beliefs.

Recognizing that perceptions can change over days, weeks and months, this study offers a view of organizations from the inside. It is a view triangulated from survey data, investigative reports, and interviews at the site. As a starting point, the following chart was compiled from a survey conducted on behalf of the Department of Energy that evaluates the Safety Conscious Work Environment (SCWE) across contractors.

Table 6.1: Summary of survey results regarding workers’ perceptions about raising concerns within DOE regulated organizations

Statement	Responses on a scale from 1 to 5 with 5 indicating the strongest agreement (N=6,532)			
	BNI/URS	CHPRC	WCH	WRPS
I feel free to approach my immediate supervisor regarding any concern	4.41	4.34	4.42	4.16
I am confident that safety concerns I raise will be listened to and acted on	3.97	3.86	4.20	4.05
My immediate supervisor supports my right to stop work if I see something unsafe	4.51	4.30	4.55	4.61
I feel I can personally stop unsafe work	4.45	4.48	4.58	4.54
I am treated with dignity and respect when I raise a safety issue	4.15	3.99	4.28	4.22
Within the last year, I have NOT observed retaliation among my peers	4.05	3.99	4.14	4.17
In my company, people are willing to report safety issues	4.19	4.16	4.25	4.25
Management at all levels encourages me to raise safety concerns through my avenue of choice	4.40	4.19	4.47	4.37
If I were uncomfortable raising a concern through other means, I would raise the concern with my Company’s Employee Concerns Program.	4.10	4.05	4.25	4.10
I am free to raise safety concerns without fear of retaliation	4.04	3.98	4.22	4.11

Source: The 2012 Hanford Organizational Climate and SCWE Survey

The survey was administered in June 2012, about six to eight months after my field work. It was developed by EurekaFacts LLC and modeled after other survey instruments used by “DOE contractors, the Nuclear Regulatory Commission or its licensees (commercial nuclear

utilities), the Nuclear Energy Institute (NEI), and the Institute of Nuclear Power Operators (INPO).” A total of 6,457 employees responded to the survey.

The results appear to be largely positive, with most ratings exceeding 4.0. However, the contractor administering and analyzing the results observed “high-reliability organizations, due to the high impact and large consequences of any imperfections, need to strive to attain a score much closer to 5.0. The ORP Site and the overall Hanford Site need to set goals to strengthen their organizational and safety culture to set it well above the average level and bring it closer to the excellence level” (EurekaFacts LLC 2012, 9).

Some of the comments included in the survey results also revealed some concerning views about safety culture. The following comments appeared in the report:

- Look into how management retaliates back towards the work force for bringing up safety issues and hold management accountable for their actions.
- When I have had issues, it sometimes feels like management gangs up on me and almost makes fun of my comments in front of others (intimidation). It needs to stop.
- Lots of retaliation for bringing up a safety concern or a stop work, retaliation from senior management.
- Management supports all the programs like employees concerns, VPP, safety committees, etc. However they don’t really want you to use them.
- Most people are not going to bring up ANY safety issues while the threat of another workforce restructuring looms ahead.
- Provide a stable work environment. No one wants to raise concerns because they do not want to be put on the black list for the next round of layoffs. (EurekaFacts LLC 2012, 53)

Some of these kinds of concerns were raised and explained during interviews at the site. Some of the views I heard may have been the result of self-selection, where conditions of my human subjects approval made random sampling impossible. Nevertheless, these perspectives

offer important insights into the ways in which workers come to understand how dissent is valued, or not, within their workplace.

Bechtel National Inc.

Bechtel National's primary task at the Hanford site is designing and constructing the vitrification plant. Following the concerns raised by Dr. Tamosaitis, the Department of Energy's Office of Health, Safety and Security (HSS) conducted a review of the safety culture within the Waste Treatment Project in 2010. The review included interviews with 250 managers and staff at DOE's Richland office, Bechtel and its subcontractors. The HSS team focused in particular on reporting and resolution processes, willingness to raise concerns, and fear of retaliation. This included interview questions, as well as a review of a sample of technical issues that were considered closed. Finally, the team observed meetings where technical issues were discussed and resolved.

The HSS team found disparities between the support for principles of nuclear safety and other individuals working on the Waste Treatment Plant. Some expressed the concern that "management communications about expectations for nuclear safety and quality have not been consistent" and that "BNI management has created a 'chilled' atmosphere that discourages individuals from reporting safety concerns" (Department of Energy 2010, 15).

The report issued by the HSS review team found that one of the most significant concerns was "subtle retaliation – i.e. that individuals who raise safety issues would not be selected for new assignments as their current assignments are completed" (Department of Energy 2010, 15). Another weakness identified in the report related to the formal mechanisms "for workers at the WTP project to report and get resolution on concerns related to environment, safety, health,

quality, and adverse actions related to raising concerns (i.e. harassment, intimidation, retaliation, and discrimination)” (Department of Energy 2010, 11).

An estimated 140 concerns had been reported annually through Bechtel’s Employee Concerns program. But the report noted that some WTP employees in the engineering organization “reported instances and conditions where there is pressure, disparagement, or retaliation for raising concerns or initiating PIERS” (an internal system for tracking technical issues). Equally concerning, the review team found that the Differing Professional Opinion process had only been used once in four years (Department of Energy 2010, 11).

Five years earlier, the Department of Energy noted similar shortcomings in Bechtel’s safety culture in a letter to Bechtel’s project director. The Richland DOE Office of River Protection (ORP) interviewed 117 current and former Bechtel employees in November of 2004, and noted three themes. “First, workers described a chilling effect with regard to fear of retaliation for reporting safety, medical, and labor relations issues. Second, workers alleged that a few supervisors contributed to a hostile work environment through racial discrimination or sexual harassment. Third, workers expressed dissatisfaction with the BNI Labor Relations and Employee Concerns processes” (Department of Energy 2005, 1). The letter requested that Bechtel submit a “corrective action plan” within 30 days.

It isn’t clear what action was taken to address the safety culture issues outlined in the 2005 ORP assessment and cover letter. What we do know is that Walt Tamosaitis’ case prompted the 2010 investigation and report. Subsequent to this event and review, was “another whistleblower revelation/event in late 2011, subsequent allegation of retaliation by a BNI manager, and a differing professional opinion filed by an ORP staff member” (Department of Energy 2012, iv).

In 2012, the Department of Energy's Office of Health, Safety and Security again conducted an investigation, in part, to satisfy a recommendation by the Defense Nuclear Facilities Safety Board. The HSS review team again found the safety culture lacking. Their report noted, "While there is no fear of retaliation in the ORP (including the DOE-WTP) work environment, there is a definite unwillingness and uncertainty among employees about the ability to openly challenge management decisions. There are definite perceptions that there is not an environment conducive to raising concerns or where management wants or willingly listens to concerns. Most employees also believe that constructive criticism is not encouraged" (Department of Energy 2012, iv).

These reviews, reports and assessments show that despite suggestions and demands for corrective action by the Department of Energy, little has changed in terms of individual perceptions within Bechtel and its subcontractors over the seven-year period from 2005 to 2012. External pressure from Congress and attention paid by the DNFSB has increased over this period, in part due to the fact that Tamosaitis' concerns became very public in the wake of his demotion and ultimate firing. These reviews and reports suggest that if anything, the culture within Bechtel has become less conducive to raising concerns and dissenting opinions. Yet the nature of the Waste Treatment Plant and the technical challenges it presents appear to demand just such a culture if it is to succeed. The dichotomy, or irony here, is that at a time when an organization is least receptive to individual concerns due to heightened attention and high stakes is the same time that insiders are most likely bring about organizational change.

CH2M HILL Plateau Remediation Company

CH2M HILL's primary role at the Hanford site is decommissioning reactors and some buildings, treating polluted groundwater, and generally reducing the footprint of environmental contamination in the central plateau area of the site. In 2009, the company conducted a survey of its employees and subcontractors. Although the company is regulated by the Department of Energy, the survey was based on the attributes of a Safety Conscious Work Environment (SCWE) outlined by the Nuclear Regulatory Commission.

According to the survey's summary, seven of the eleven SCWE attributes scored "good" or above, and none scored "poor" or below. The strongest attributes included "free flow of information, commitment to safety, and conservatism" while the weakest attributes included "critical self assessment, alternative avenues for raising concerns, and people management" (CH2M HILL Plateau Remediation Company April 2009).

The following are examples of responses to specific questions in the survey:

Table 6.2: Summary of survey results regarding workers' perceptions about raising concerns within CH2M HILL Plateau Remediation Company (2008)

Category	Statement	Response Scale from 1 to 7, with 7 indicating strongest agreement
Free Flow of Information	I am free to raise safety concerns without fear of retaliation	5.87/7
	My supervisor supports my right to stop work if I see something unsafe	6.15/7
	Management at all levels encourages me to raise concerns through my avenue of choice	5.69/7
Commitment to Safety	My immediate supervisor is committed to safety	6.13/7
	Expectations for safe execution of my work is clear to me	6.11/7
Conservatism	I take action if I see potentially unsafe conditions, work practices, or products	6.42
	My supervisor is effective in promoting and encouraging a questioning attitude	5.77/7
	CHPRC is performing work safety at the Hanford Site	5.55/7
Critical Self-Assessment	My work group performs rigorous self-assessments and has made process improvements as a result	4.85/7
Alternative Avenues for Raising Concerns	I have taken a concern to the Employee Concerns Program and it was effective in resolving my concern	4.19
People Management/Trust	People in my work group are held accountable for their behaviors regarding compliance and safety in the workplace	5.42/7
	Human Resources policies and procedures support CHPRC's commitment to safety	5.28/7

Source: CHPRC Survey, April 2009

Interviews with a worker (personal interview, September 28, 2011) and a manager (personal interview, October 24, 2011) at CHPRC helped put these survey results into perspective. First, the manager described the process of planning work, which depends on the scope of the job at hand. Planning is a collaborative effort that includes workers who will perform the job so they are aware of the hazards, and can contribute ideas for the best way to complete the work. It is a first opportunity for dissenting opinions, raising questions, and expressing concerns. Often, however, there is a time lag between the job planning and actual work, so the workers involved in planning may not be the same ones who perform the job. If not, bringing new workers onto the project presents a second opportunity to raise concerns. A third opportunity, this manager explained, is to “stop work.”

The “stop work” authority means that any employee can halt work for safety reasons. There is a legal basis for this authority, but every worker and manager interviewed for this study spoke about “stop work” in terms of workplace policies for encouraging workplace safety. This manager offered that “stop work” is a useful opportunity to rethink how the work will be done. We encourage the use of “stop work” for a number of reasons, he said. First, management doesn’t want someone to get hurt. Second, stopping work may result in determining a better way to do the work.

The general perception though, he explained, is that if you stop work, you will be perceived negatively. When I was a carpenter, he said, I had the same perception. As a worker, I might not stop work, but may find a better way to do it. The most difficult challenge, in this manager’s view, is the nonverbal cues supervisors might give a worker who raises a concern. If he rolls his eyes or his body language is negative, he explained, it is hard for workers to overcome that perception. The other struggle the CHPRC manager described is that of peer

pressure. As an example, he noted that if a worker stops work prior to a holiday or a milestone mandated in the contract, it could cause their fellow workers to have to work an extra day over a holiday weekend. In that case, the pressure from both supervisors and peers to continue working is powerful. So, he said, getting workers to feel comfortable stopping work is hard to do, not just at CHPRC, but across the site.

A worker interviewed for this study also discussed the issue of “stop work” authority. His thoughts reflected years of experience at Hanford, as well as another DOE site and a commercial nuclear facility. Some people are saying they are getting rid of people who raise safety concerns here, he said. But he believed there is a fine line about raising safety concerns as a way to impede work, and safety for real. He said, the underlying purpose can be interpreted different ways by different people. Somewhere in the middle is the truth.

The manager also raised the issue of hidden agendas behind “stop works,” offering that not all were useful in terms of improving safety. During the summer of 2011, the company had averaged about five to eight “stop works” a month. This manager’s sense was that most raised an important safety issue – an anomaly would be the one that didn’t have the best intent. He added that you have to treat them all equal or you will send the wrong signals. He noted an important principle that managers responded appropriately to every stop work, otherwise they would be at the risk of “killing the process.”

The CHPRC manager discussed other avenues of raising concerns, which always begins with a first line supervisor. But an employee can work up through the levels of management all the way to the president, as well as through the union. A worker could also go to the company’s Employee Concerns Program manager, who reports directly to the president. Generally, he explained, a worker has a vision of how the work could be done better. And generally, he said,

that vision is “spot on.” He believed that most workers in his company were willing to raise concerns with their first-line manager, and that willingness depended mostly on interpersonal relationships.

This CHPRC manager also offered that willingness to raise concerns also hinges on the type of concern. For example, he said, telling a manager about the need for safety glasses is much easier than stopping a process that may have some schedule pressure. He went on to explain that CHPRC’s contract with the Department of Energy includes incentives for work completed and milestones reached. CHPRC includes employees in the incentive, he said, offering a share of the bonus based on a metric of safety, environmental and production factors. The downside is that workers may be reluctant to report injuries or safety concerns that could compromise earning DOE incentives and individual bonuses.

In the months preceding my field work at the Hanford site in the fall of 2011, a number of incidents had occurred during the dismantling of the Plutonium Finishing Plant (PFP). These incidents were on the minds of people I interviewed at CHPRC, so they entered our conversations. During four separate incidents, workers had been exposed to levels of airborne radioactivity that exceeded the regulatory limits, or had an “uptake” of small amounts of plutonium. The manager raised this issue, which had received media coverage, as an example of continuing to “do work the way it has always been done.”

A CHPRC worker also identified past practices and attitude toward the work as a contributing factor. He described the way of doing things as “Hanford-ized” - a term recognized and used by others at the site. The term emerged over time as workers and managers at the site adapted to unexpected circumstances and risks. Without standard operating procedures for every circumstance, workers learned to improvise and make things work. Others have described this

phenomenon as “the dark side of the can-do spirit that had made Hanford work during World War II” (D’Antonio 1993, 107). Work at the site depended more on expertise, experience, and trust rather than standard operating procedures. As nuclear standards developed over time, workers and managers often continued to favor their own judgment over standards.

This worker also suggested another, curious aspect of “Hanfordization” which seemed a unique perspective. He suggested that there was “too much transparency” at the site. As an example, he noted that one time an incident had happened at work late one evening of which he had no knowledge. He learned about it by reading the paper the next morning, before coming to work. This would never have happened at the Nevada Test Site, he reckoned. There, they constructed an entire model city in the desert in order to destroy it using the largest non-nuclear blast even conducted.

If we had told the media about our activities, he said, the men in black suits with flashlights would have come to get us. That kind of security was needed to win the Cold War, he noted. But he also suggested that workers there were more aware of the risks they faced, likely because managers weren’t afraid the information would go outside the organization. At Hanford, he said, it seems they are more likely to “tiptoe around” those risks. Finally, he suggested that the levels of transparency and oversight at Hanford made the actual work more complex. He noted there are “five white hats for every one worker.” The craft workers get blamed for slowdowns in work, he said, when the problem is the paperwork. If someone raises a concern, it has to be documented and workers wait around for days until the paperwork is in order.

The CHPRC manager spoke to this issue from another perspective. He explained that the Department of Energy has a process for maintaining a “safety basis.” Whenever you make a change, he said, it must be screened against that safety basis. If there is a new question not

evaluated in the original safety basis, then a question must be issued – an USQ (Un-reviewed Safety Question), which must be addressed. In addition, DOE’s Integrated Safety Management standards must be met – a process intended to infuse safety into every aspect of planning, approving and executing the work.

With regard to the incidents at PFP, the CHPRC manager said a root cause analysis revealed complex set of contributing factors. The effort now, he said, is to try and change the mindset and culture. It includes having right people in a work group, but also changing policies and procedures. He believed that the greatest impact had been the new leadership approach. The company had assigned a new vice president to oversee the work, a person he believed was a very dynamic leader. How a leader portrays policies and procedures and priorities, and how they lay it out, is important for changing culture. There have been a lot of changes, he said, and people are starting to buy into it.

He summarized the keys to safe work for his company, crediting the Integrated Safety Management process and a skilled workforce. He also said the company uses concepts and ideas developed by INPO – the commercial nuclear industry group discussed in an earlier chapter. The company had licensed the use of some of INPO’s products, which he said offered excellent human performance tools. In the nuclear industry, INPO is just “good business,” he said.

Finally, I asked this manager’s opinion about DOE versus NRC oversight. The perception is that the NRC has a “bigger hammer” than the DOE, he explained. NRC has the ability to pull the license from a commercial operator, whereas DOE actually owns the facility. But, he said, DOE effectively has the same leverage by saying a contractor is not meeting the terms in the contract.

DOE can also demand corrective action by issuing “findings.” Finally, NRC can issue fines, but DOE can withhold fees. He conceded that these points of leverage are “probably not as scary” because DOE has a vested interest in seeing the work get done. The NRC is more independent because it doesn’t own the plants, he noted, but the NRC doesn’t make a regular practice of pulling licenses. In reality, he concluded that the NRC doesn’t actually have a bigger regulatory hammer in practice. Politically and otherwise, it is very difficult to pull a license, he said. It is still rare.

A year after I concluded my field work at the Hanford site, the Department of Energy sent a letter to the CEO of CHPRC, outlining its findings with regard to the incidents that occurred during the decommissioning of PFP. DOE noted that its earlier investigative report documented “significant programmatic deficiencies in the planning, hazard analysis, and execution of radiological work, which extended beyond the work at PFP. The report also documented deficiencies in training, procedures, radiological staffing, and conduct of operations” (Department of Energy September 13, 2012). The letter summarized CHPRC’s corrective actions in response to the incidents at PFP, which DOE deemed to have been effective. “The Office of Enforcement and Oversight is encouraged by CHPRC’s recognition of the programmatic work control issues, and the progress that has been made,” the letter noted. “Accordingly, the Office of Enforcement and Oversight has elected to exercise its enforcement discretion and not pursue further enforcement activity against CHPRC at this time.”

Washington Closure Hanford

Washington Closure Hanford (WCH) is responsible for demolition and decommissioning of infrastructure and cleanup near the Columbia River corridor. WCH has also been tasked with cleaning up over five hundred waste sites, and building and operating the Environmental

Remediation and Disposal Facility (ERDF). WCH's current contract will expire with completion of these tasks in the fall of 2015.

In 2005, the Department of Energy hired a consultant to evaluate Washington Closure Hanford's "safety conscious work environment" (SCWE). The consultants interviewed 125 employees and administered 122 written surveys. The review team identified several areas of concern and determined that WCH was not in compliance with contract provisions related to raising concerns without fear of harassment and reprisal (Workplace Cornerstone Group October 25, 2006, iv).

First, the team concluded that there existed a "hostile work environment" that has "contributed to the current state where there is a high degree of mistrust in management, their decisions regarding worker safety, and the raising of concerns" (Workplace Cornerstone Group October 25, 2006, 3). Second, the review team found "strong indications of a chilled work environment" where the "open flow of information – especially related to ES&H (environment, safety and health), radioactive materials, and the workplace – is inhibited by individuals' fear of harassment, intimidation, retaliation, and/or discrimination." Contributing to this perception, the review team concluded, were "several informal avenues" involving "management, their actions, and when their words are, or are perceived to be, threatening in nature" (Workplace Cornerstone Group October 25, 2006, 4). Following is a sample of the results of survey questions included in the review.

Table 6.3: Summary of survey results regarding workers’ perceptions about raising concerns within Washington Closure Hanford (2006)

Statement	Responses (N=122) Scale of 1 to 5 with 5 indicating strongest agreement
Employees are encouraged to raise concerns	3.5/5
Concerns are appropriately resolved	2.8/5
Clear processes exist that employees can use to raise concerns, and employees are encouraged to use them	3.5/5
No method of raising potential safety concerns is discouraged	3.3/5
Management demonstrates respect for differing opinions	2.7/5

Source: Workplace Cornerstone Group, 2006

Based on interviews I conducted at the site, those were dark years in terms of this contractor’s safety culture. Workers I interviewed had previously worked for Bechtel and they shared their impressions of the challenges faced by workers when WCH, a newly formed entity, took over the contract. The first worker was a heavy equipment operator who had worked at the site for many years (October 4, 2011). The second was an exempt staff person who no longer worker for WCH (personal interview, September 27, 2011).

The first worker said he believed that before URS bought Washington Group (later forming WCH) that Washington Group had a bad reputation, perhaps had even been banned from working at DOE sites. A second worker described the experience as being in the midst of a “clash of cultures” because of its partner owners including URS, Bechtel and CH2M HILL.

The first worker reported that he had received an anonymous phone call when WCH was awarded the River Corridor Closure Contract in 2005. The caller said that he should become acquainted with the whistleblower protections outlined on the Department of Labor’s website. The caller, he said, warned him that WCH is bringing in managers who are “head hunters and they will go after people like you.” This worker said he made a practice of carefully reviewing

procedures, and had successfully raised concerns before with his manager at Bechtel. His manager then would let him know what he could do about it, and they would work together to come up with a solution.

At WCH, he felt he became to be known as a troublemaker. He was assigned to a different work group, he believed, so that work could be done faster in his absence. His new work group was an hour drive further away from his home. He suggested that others who raised concerns had also been shut out of the “prime time areas” which was in his mind, the kind of subtle retaliation that makes most workers afraid to speak out. Those who were known as “yes men” had survived the most recent round of layoffs, while others with longer tenure had been let go. Despite the warning he had received from that anonymous caller, he said that he and a few others with many years of experience made it through those first few years of “stupidness” after WCH won the contract.

Like others interviewed for this study, this worker noted the inefficiencies that result from changes in contractors. He said that when WCH took over the contract for demolition work, they came in like “gangbusters” and “threw out” all the procedures, just like the previous contractor, Bechtel, had done. Like others, he reflected on a recent, serious incident that had been covered in the media. On July 1, 2009, a worker had fallen through a hatch in a catwalk while working to prepare a building for demolition. He sustained serious injuries and an investigation ensued.

In a letter to the president of WCH, the Department of Energy summarized the findings stating, “DOE considers this event and the associated violations to be of high safety significance. DOE’s evaluation of this event identified extensive weaknesses in WCH’s fall protection, ladder safety, and construction safety programs that exposed workers to unmitigated fall hazards. WCH

failed to comply not only with applicable DOE and Occupational Safety and Health Administration regulatory requirements, but also to establish worker safety and health program provisions that addressed worker exposures to fall hazards while using fixed ladders. WCH did not identify and assess the hazards associated with ongoing demolition work when the planned tasks for preparing a bridge crane for removal changed” (Department of Energy August 19, 2010). The Department of Energy did not levy a civil penalty, but would reduce the fee paid under the contract by \$1.7 million. The worker interviewed for this study recalled the incident, stating that after the “fall incident” new procedures had to be written once again.

This WCH worker also talked about his experience and perception with raising concerns. He said he was a rare worker because he didn’t worry about losing his job. As a heavy equipment operator, he said, there was plenty of work in the Tri-Cities and if he were fired, he’d find work somewhere else the next day. But, for those whose work was related to nuclear activities, what choice would they have but to pick up their families and move to another community with a nuclear site? So, he wasn’t shy about raising concerns and said he had been to the Employee Concerns Program several times. He said the process had been generally effective. But he believed so only because he had been there for many years and knew the “ins and outs.”

As an example, he described a concern he had about heavy equipment working on the wrong side of a boundary. He said that he was accused of lying and simply trying to stop work. So, he asked if they wanted to see pictures of the violations. At that point, he received an apology and the problem was resolved. He said he had done “dangerous” things that put him at risk when he was younger. When his best friend was killed on the job, it was a wake up call for him. “It should have been me who was buried in that hole,” he said. After that incident, he said

he started paying careful attention to rules, making “damn sure” that he and others “walked away from the job site every night.”

When I asked whether he had gone to the DOE ECP or his own company’s ECP, he responded by explaining, “here is what you have. DOE ECP sends it back to WCH ECP. So it is basically go back and talk to your people. So there isn’t really a DOE ECP.” He said he believed that a worker would have to prove a life-threatening situation for DOE to take immediate, independent action. If one alleged reprisal for raising concerns, he believed there would need to be a clear loss of wages before DOE would take action.

He summarized his perception of the company as “not having the mentality for hearing concerns.” This he attributed partly to the pressures for production. Apparently, he reviewed a plan for demolishing a building that contained asbestos and reported to his supervisor that workers would be unable to complete the job using the existing plan. The manager responded by accusing him of trying to stop work. The same manager came back to him three months later, he said, and apologized. The manager explained that he was “getting pressure from the top,” and couldn’t help his response. In this workers’ view, managers are pressured to “down a certain number of buildings every month.” These mid-level managers get pressure from the top but don’t say so or maybe even recognize it.

This worker was thoughtful about the range of pressures coming to bear on his organization. He noted the dual role that DOE plays as the regulator and owner of the site, which he noted, is different than most private sector dynamics. They need to clean up the river corridor, he acknowledged, and can only get funds if they show they are moving forward. Then it becomes a balancing act for DOE - they can’t apply too much pressure for safety if it compromises production. The contractor has to be able to make a profit. So, even though they talk about

safety, DOE and the contractor are both responding to production pressures. It is there even if it isn't meant to be there, he said. Workers have ways of pushing back from below too. This worker said he has reminded his manager, "I can go fast or I can go good, but I can't go good and fast."

When asked about raising concerns outside of his organization, this worker said he felt "very aware" of his legal rights. He knew if he experienced retaliation, he could file a claim with the Department of Labor. Although he didn't have a clear idea of what that process might entail, he said he "bet there is lots of red tape involved." "You are definitely going to be marked as a bad person. You would have to take that into account in everything you do," he said. He believed the message from managers and the Employee Concerns Program is that the Department of Labor process was an option but "we prefer you don't use it."

He reflected on the role of WCH leadership. Carol Johnson took the helm of the company in November 2010. Johnson previously served as executive director of infrastructure for URS at the Sellafield remediation project in the United Kingdom. Johnson had served as president for about a year, when I interviewed this worker, and he noted she was a "pretty good lady." Other workers and observers interviewed for this study also admired her efforts to change the company's safety culture, and by the time she retired in October of 2013, believed that she had been very successful.

But change doesn't come easy. "Carol can push as hard as she wants," this worker said, but mid-level managers and line supervisors will do what they want. He described the difference between what management called an "open door policy" and what workers referred to as a "back door policy." On the one hand, managers up to the company president said their doors were always open to workers to report concerns. But in reality, he said, managers have a way of

pushing those concerns out the back door if they compromise production or profits. It is especially important for people between the front-line managers and the president to live by the open door policy, he said. “Laws don’t mean much just because you put them down on a piece of paper. People have to buy into them.”

Washington River Protection Solutions

Reducing the risk of contamination from Hanford’s 177 underground tanks has proven one of the biggest challenges for the site. Transferring waste from antiquated single-shell tanks to newer, double-shell tanks until the waste can be processed for long term storage is costly and presents significant risks to workers. In 2008, the Department of Energy granted Washington River Protection Solutions (WRPS) a \$7.1 billion contract over a ten-year period to manage the tank farms. Prior to WRPS, the tank farms were managed by a CH2M HILL subsidiary. After approximately a year on site, WRPS conducted a worker survey to assess its “Safety Conscious Work Environment” (SCWE). Following are sample responses provided by workers:

Table 6.4: Summary of survey results regarding workers’ perceptions about raising concerns within Washington River Protection Solutions (2009)

Statement	Response indicating agreement
I feel free to safely raise concerns without fear of retaliation from my peers or management	93%
If I see a potentially hazardous condition, work practice or product, I will take action (i.e., stop work to correct it, report it, and caution others)	99%
I am aware of avenues other than line management that can be used to raise safety concerns	96%
The ECP process is effective in resolving my concerns effectively	90%
I have not observed retaliation from management	93%
I am aware of and/or have concerns that have NOT been reported which could affect safety	11%

Source: WRPS Safe Work Environment Survey, November 2009

The survey results appear to indicate a culture where workers are willing to raise concerns with little concern for retaliation. Workers and a union official interviewed for this study perhaps reflected a minority view, or changes in the two years since the survey took place. Their view of the company was decidedly different.

The first worker I interviewed started working at the site in 1979, although her work history included a few breaks. She was currently serving in a professional, non-union, position (personal interview, September 21, 2011). The second worker had a 19-year history at the site and currently served as a union steward. Most of his time had been spent working in the tank farms, although he had recently been transferred (personal interview, November 18, 2011). Both workers had been employed by several different contractors at the site.

The first worker noted immediate difference in management approach once WRPS took over the contract. The new attitude, she said, was “this is how we are going to do business. Don’t question.” Although she hadn’t seen actual retaliation, her perception was that workers who raise concerns get “labeled.” A label, she said, could result in passive hostility and challenges to anything a worker might raise. A worker had to acquire “credibility” before their concerns would be taken seriously. “Credibility,” she said, “was determined by whether others would stand by you. It was almost like you had to have a coalition of people.”

This worker said she had always felt comfortable raising concerns until WRPS took over. She described some examples that led her to feel differently than she had in the past. In one instance, she had seen a co-worker approach a supervisor with an issue of concern. Before her co-worker could finish explaining the situation, the supervisor held up his hand and said, “All right, you told me.” Another example was that she and her co-workers believed that management would not share accountability for anything that went wrong. So, she said, they worked together to keep things from management, determining instead to resolve issues on their own. For her own part, she said she would not consider reporting anything outside her own chain of command. She believed nobody in her work group would report concerns to DOE.

Workers in 2011 were facing layoffs, and she said in light of the upcoming cuts, people weren’t willing to raise issues or become labeled. “Right now,” she said, “you just want to survive.” Unlike members of the bargaining unit, people in professional positions could be laid off based on job performance rather than seniority. The criteria related to performance, she believed, was subjective and could include laying off those who raise concerns. As a result, she explained, “the bargaining unit has always been able to be more vocal.” For professionals, she

believed that layoffs wouldn't be based on job performance but on the list of people the company wanted to get rid of.

The layoffs were taking place in part because money awarded under the American Recovery and Reinvestment Act of 2009 (AARA), which provided "stimulus" money for projects at the Hanford site, was running out. "Once AARA is over, some people say it will go back to the way it was," she explained. "But it will never go back because of the new people. People will look and see who they (the company) kept and who they got rid of. If they get rid of experienced workers with knowledge and who are willing to raise concerns, the layoff will create even more silence. Who they select for layoff will send a message."

Like other workers I interviewed, she had a general sense of rights in the workplace, and described how her expectations had changed over time. She said, "Before the family leave act, we had to work overtime. If you didn't there was somebody else to take your place. Back then, a hostile workplace was something you put up with. Sexual harassment was something you put up with. Workers have rights today." She then compared her current employer with the previous contractor. "CH2M HILL didn't want to violate workers rights or the law. My perception of WRPS is that they don't care - about safety or about any other workers' rights."

When asked whether or how DOE might become aware of the situation, she said she believed that the heads of the companies were closely tied to DOE regulators. Like others, she noted that "everyone is politically motivated to make sure the vit plant is up and running." She pointed to the case of Walt Tamosaitis, noting that he had been well-known and respected on site. Being removed from his position, she believed, was politically motivated, and that DOE probably played a role in his removal. His case served as an example to everyone on the site, she

said. “Nobody will raise a hand and say there needs to be a change because of the Walt Tamosatis case.”

The second worker interviewed for this study also reflected on changes since WRPS had taken over the contract. Like other successors, WRPS began making changes to policies and procedures, he explained. “But,” he said, “they were based on lessons learned and past incidents.” Unlike other successors, he believed that WRPS upended a culture of joint efforts by labor and management, a culture he believed was a tenet of the Department of Energy’s Integrated Safety Management. He attributed the new management approach, in part, to the leadership team brought in from the Department of Energy’s Savannah River Site (SRS) in South Carolina.

This worker had visited the Savannah River site previously as part of a “lessons learned” program. Like Hanford, SRS has tank farms holding high-level nuclear waste. However, he believed there were big differences in terms of health and safety, and worker involvement. At SRS, he asked one of the managers where the “teaming” was between management and labor. The manager told him, “We don’t have that here.” The manager said it was a top-down driven site in a right-to-work state, where workers were not represented by a union.

So, he asked workers at SRS, where is your ownership of this site? Have you ever used your stop work authority? He said, the workers answered “no.” When he asked how they resolve problems, they told him that they report to a manager, who then brings them an answer. He said, “A lot of workers weren’t as educated or trained as those here at Hanford. They seemed more timid, afraid of losing their jobs. I heard managers there say that ‘if you don’t want to do this, there are ten workers standing in line to take your job’.”

Unlike Savannah River, he said, Hanford has always relied on its safety committees, where exempt managers and union workers worked “hand in hand.” He explained that through these committees, union members see that they “have as much power as an exempt person.” But participation in safety committees and trainings began to decline when WRPS took over, he said. He attributed this change partly to management brought in from Savannah River, and partly to incentives in the contract for meeting cleanup milestones. If milestones are met at the end of each year, he said, workers would receive a \$1,500 bonus.

The company also instituted cost saving measures that affected safety. For example, he said that safety meetings used to have over 95% attendance by the work force. But WRPS made changes so that safety meeting attendance was no longer required. Now, most workers elect to stay out in the field and get more work done. The safety meetings were a place to discuss lessons learned and make sure that mistakes aren’t repeated. He said new WRPS management figured it would save \$110,000 per year if safety meetings were eliminated. These savings would come from more hours spent in the field, and reduced time tracking and compiling data. The lack of safety meetings and pressure to get work done was contributing to “work arounds” or ad hoc adjustments to standard operating procedures. It was a worrying trend that he believed could have serious consequences for safety.

The previous contractor, a division of CH2M HILL, developed a database for tracking issues called the Problem Evaluation Request (PER). Previously, the contractor had several different databases, and implementing the PER system was intended to achieve principles of nuclear safety outlined by INPO, allowing for a single system that could track trends over time. But managing the system and closing out issues proved unwieldy for managers, and workers began to lose faith that items entered into the system would receive attention. When WRPS took

over the contract, he said management put pressure on workers not to enter anything into the system that might have a regulatory consequence.

He described an instance where one of his managers approached him about the use of the PER system. He said the manager “wanted to give me some advice.” He recalled the conversation, saying that the manager told him “the company management always sees me as being like DOE, always waiting to write things up. Just work with me and if they fix it, then everything is fine. No need to put all this in writing. I thought, my gosh, my own health and safety manager is telling me not to document serious items, non-compliant items. But if we get in trouble later, then no one can be held accountable, which is what management wants. The message I expected was that they were going to be supportive of me and my raising issues, then documenting them. This just shows that they say one thing, but do another.”

He believed that employees were losing avenues for raising concerns. Previously, he said, he and others would have gone to councils (or committees) to resolve concerns. He believed the committees had ceased to operate, in large part, because the committee chairs had “walked away” out of frustration that management would not participate or respond. The committees used to track the closure of PERs and analyze performance based on an analysis of the PERs. Now, he said, no one is analyzing those indicators.

The safety committees also had a “top ten” list - a concept used at other commercial and defense nuclear facilities. The “top ten” list is a continuously updated list prioritized by workers and union representatives. When issues on the list are resolved, it is updated with new items in an effort toward continuous improvement. “We would take the issues into management, and work them off in a prioritized way. But that went away. No more top ten list. I said that list was

not just to be derived from PERs but also from walkdowns, other issues raised. Someone should be tracking and prioritizing PERs and other issues.”

He provided these examples as evidence that management wasn't interested in worker input. In fact, he believed management saw workers as a problem, not part of a solution to getting work done safely. He recalled a meeting where he had pointed out how often workers had been right, and their record of performance. “Next thing I know, he said, “safety reps are being rotated. Others got fired. I was transferred. Those left on (safety) committees have all walked away. The amount of PERs filed and issues raised by workers have been reduced by I would say at least 50 percent. Workers see where I was transferred. Now they (management) are wondering why they have no worker involvement. They don't realize that they are the ones who did it.”

I asked whether the Employee Concerns Program (ECP) was a useful place to resolve safety concerns. He believed that his own company's ECP was “stifled” by senior management, so he did not take concerns there. However, he had submitted concerns to the DOE ECP. His concerns had been “substantiated” by the ECP manager, he believed, because he brought evidence and photos to support his concerns. But at the time of our interview, DOE had recently restructured the ECP and removed the manager. He believed the change had been requested by URS, WRPS' parent company. URS, he believed was politically powerful and had exerted pressure at DOE Headquarters to make the change.

Like others interviewed for this study, this worker raised the fact that DOE owns and regulates the site, and isn't even subject to OSHA regulations for worker safety. He noted that DOE said they will follow worker safety requirements set by OSHA and NIOSH (National Institutes for Occupational Safety and Health). They will use the most conservative standard.

That is good, he said. “But it is like the fox guarding the henhouse.” This, he believed, led to lax oversight of contractors by DOE.

“I hate to say this,” he said, “but I think that DOE turns a blind eye. (I) know they did during this AARA work. They knew we needed to get so much done during a certain amount of time, that Congress will pull the money and we’ll have to eat it if the money gets pulled. DOE sat in the their offices, let contractors do what they wanted. I reported some concerns to DOE and they said we need to get this work done. Don’t get me wrong, we need to get work done. But I can’t believe that we can sacrifice safety for production.”

Both workers interviewed from WRPS noted the presence of the Defense Nuclear Facilities Safety Board on site in the wake of the concerns raised by Walt Tamosaitis about the vit plant. Representatives from DOE Headquarters had come out to the site to investigate. But, the first worker explained, they never came out to the site to talk with workers at the tank farms. Instead, they just met with WRPS and DOE people downtown Richland (in the corporate offices).

The second worker also commented on the recent heightened attention by DOE Headquarters and members of the DNFSB. “They are here (investigating) now,” he said. He believed that DOE Headquarters had previously found WRPS’ requirements for Integrated Safety Management lacking. “But,” he said, “nothing changed until the last six months when the DNFSB has been here.” The DNFSB had “come on strong, making tough accusations and issuing findings.” Still, he said, WRPS has workers at the tank farm in a state of “shock and awe.” He worried that “something bad is about to happen.”

This foreboding comment was worrisome, although I’m not sure if he had a specific concern in mind. Bad things have indeed come to pass at the tank farms. Between March and

July 2014, forty-two WRPS workers required medical attention after succumbing to vapors in the tank farms. The Department of Energy maintains that their monitoring shows no evidence of exposure to vapors, although they acknowledge the workers' symptoms. The exposures have been widely covered in the media, led by Susannah Frame of Seattle's King 5 News. The news coverage has prompted Representative Adam Smith, and Senators Patty Murray and Maria Cantwell to demand answers from DOE's Energy Secretary.³³

Energy Northwest

Energy Northwest operates the Columbia Generating Station located in a leased portion of the Hanford Site. It is the only one of the five organizations in this study regulated by the Nuclear Regulatory Commission. In 2011, Energy Northwest conducted a survey of its permanent and temporary employees, contractors, and vendors, totaling 1,280 people. The survey contained the same questions as in the prior two surveys conducted in 2009 and 2007. The survey sought to assess the safety culture and Safety Conscious Work Environment (SCWE) at the commercial power plant. The executive summary of the report results states, "Energy Northwest is committed to safe plant operation and to maintaining a SCWE where all concerned individuals feel free to raise any concerns both to the company and to the Nuclear Regulatory Commission (NRC) without fear of harassment, intimidation, retaliation and/or discrimination (Policy Statement Manual, PSM 6.15)."

The survey was sent electronically and received 1,157 responses, which represented a 120% increase in the response rate from 2009 and a 198% increase compared to the 2007 survey.

³³ <http://www.king5.com/news/investigators/States-DC-lawmakers-pledge-action-for-Hanford-workers-260208001.html> accessed July 31, 2014

The 2011 survey revealed both positive perceptions of the value of dissent, but also some disturbing changes since the prior survey. The following summarizes some key survey findings:

- “An overwhelming majority of respondents rated the work culture as supportive of raising nuclear safety and quality concerns. For example, 99.7% of respondents believe they are responsible for identifying and reporting problems and adverse conditions and 97.1% believe the Energy Northwest culture is conducive to raising nuclear safety and quality concerns.
- Ninety-four percent (94%) of respondents agreed with the statement that they “could raise a nuclear safety or quality concern without fear of retaliation” while 6% did not agree with this statement.
- Almost all respondents (98%) were familiar with the Employee Concerns Program (ECP) and approximately 94% of respondents endorsed questions supportive of the program.
- Most respondents believe that management standards are clear and effectively communicated, that management wants employees to report concerns, and that management takes effective corrective actions when nuclear safety and quality concerns are identified.
- However, 18% (up from 11.5%) do not necessarily believe that management’s expectations in these areas are consistently applied in performance reviews, rewards, and work quality. Also, 14% (up from 8.7%) are not confident that issues reported through the Corrective Action Program (CAP) are appropriately prioritized, thoroughly investigated and resolved in a timely manner.”

Source: Energy Northwest, Columbia Generation Station 2011 Nuclear Safety Culture and Safety Conscious Work Environment (SCWE) Survey Analysis Results

In 2011, the Columbia Generating Plant was in the process of renewing its license to operate until 2043. While I was conducting my field work in the fall of 2011, the Nuclear Regulatory Commission was holding public hearings as part of an extensive review process. The plant had gone offline as planned on April 6, 2011, for the most extensive and costly refueling and maintenance shutdown in the plant's history. The shutdown was expected to take 78 days and cost approximately \$150 million, but unexpected delays and work stoppages prolonged the process. During the refueling and maintenance operation, the workforce increased by approximately 50%. The plant returned to operation in late September 2011.

I interviewed two workers employed at the Columbia Generating Plant (personal interview, October 18 and 19, 2011). These two workers were influenced by these events, as evidenced by the examples they provided and their emphasis on the importance of public safety. Their insights provided context for the survey conducted earlier in the year, and helped to illustrate the overall approach to safety, as well as challenges at the plant. These workers emphasized their belief that their plant, and nuclear power in general, operated safely. "We stress nuclear safety above all," the first worker said. "We have a responsibility to not have a release. The health of the public is a must."

The first worker I interviewed, a union steward with 26 years experience at the plant, began by discussing how safety is embedded in the work. First, pre-job planning briefings outline how the work meets principles of nuclear safety and personal safety. Workers are required to formally observe their peers by asking if they can "do an observation." The worker then observes whether his or her peer is working safely and provides feedback to the person about what was done safely or what might be cause for concern. The observer then writes the

observation down on a card, without the name of the observed person, and turns it in to a supervisor. “No name, no blame” statistics are then compiled and workers receive summary statistics showing trends.

In addition to statistics about their own plant, workers are briefed about the causes of well-known accidents like the *Exxon Valdez* and BP Deepwater Horizon oil spills. “You only see ten percent of an iceberg,” this worker observed. Managers and safety trainers “say we need to catch the things under the water. We try to get those things under the water by doing analysis.” Workers do this by studying the causes of accidents and human error. “We utilize these tools to try and maintain highest safety standards. There is no such thing as a minor error in a nuclear plant,” this worker noted. Being diligent about safety on the smallest of jobs, he explained, establishes a pattern that can improve overall safety.

The company also has “Internal Review Boards” (IRB) to investigate incidents. This worker described an incident that happened “while ago that scrambled the plant (an unplanned shutdown) and the company tried to blame it on the front line workers. Management wanted to put a letter in their files. I said no way. I used the analogy of the boulder rolling down the hill. If the CEO is pushing from the top, and workers are down at the bottom of the hill, who is in the position to stop the boulder?” The IRB identified the players, he said, and determined the need to hold people accountable all the way up the line. In the end, he said, they decided not to put letters in any files. The process was different now than it had been twenty-five years ago. He contrasted this incident with one long ago where he and another worker had failed to follow a procedure. The IRB took them to separate rooms and interrogated them. “It’s different now,” he said. The process is less adversarial.

The industry group INPO also compiles a list of occurrences and events at each plant in the U.S. that become the basis of discussion and analysis. “We ask, can it happen here? Maybe. We evaluate. We talk about it and share knowledge,” he said. The plant also utilizes “reverse briefs” where workers “brief the manager to show why things that happen at other plants can’t happen here.” Problems usually arise when plans aren’t properly implemented, he explained. So, workers use a “take two” card to write down things they need to be aware of in their environment. “People who come out there for the first time think we take forever to get things done,” he said. “But if the plant goes down, it is a million dollars a day.”

The company makes use of safety committees that include a cross-cut of the workforce, including members from different crafts and management. Their work includes maintaining a “top ten” list for safety improvements. As one item is completed and removed from the list, another is added in an effort to continually improve safety. There are safety manuals that outline standards. This worker suggested that if a worker raises a concern, for example, about using a ladder, the company would take the most conservative approach. Even if the manuals don’t require it, he said, management would build a scaffold to help the worker feel safe.

In addition to the processes built into the work, there were a number of ways of raising a concern, the first worker explained. The company prefers that a worker raise an issue first with a supervisor. But if someone is uncomfortable doing that, they can go to a union steward. Or they can approach one of the two NRC regulators that work on site and often oversee the work. Or, they could call the NRC hotline if they want to report a concern anonymously. Finally, they can consult with the Employee Concerns Program.

This worker believed that most everyone in the company felt safe raising a concern, and that the company is open to hearing safety concerns. “Some people will try to bring up safety

concerns to avoid work,” he noted, although he estimated those workers to be a very small minority. “Less than two percent of the workers would fall into this category,” he estimated. “But if they raise a concern, we will go to the ultra extreme to take care of it. Most workers want to get the job done, and we have the resources.”

On the other hand, a second union steward interviewed for this study, who had been with the company since 1988, had a somewhat different view. He estimated that half of the workers might not be willing to raise concerns, or at least, might believe that raising concerns would not result in any action.

Reflecting on the recent maintenance and refueling outage, both workers noted that outages present the greatest opportunity for incidents, and that the presence of contract workers contributes to greater challenges in the workplace. “There are two safety standards out there, according to some people,” he said. “Contractors come in and have less scrutiny. Troubles in the past have been related to contractors, not always, but often. They are generally less experienced, not as knowledgeable about procedures. We are responsible for overseeing the contractors. The (recent) outages were largely due to actions of the contractors. We are working on that by developing new oversight procedures.” Other workers and union officials also noted that contractors and sub-contractors – both at the generating plant and at the defense part of the site – created challenges for oversight, consistency, and a shared safety culture.

Both workers interviewed at Columbia Generating Plant discussed events that occurred during the recent maintenance outage. Specifically, they talked about the event in the context of the new CEO, Mark Reddemann, who had taken the helm in August of 2010. Reddemann and his new plant manager held joint meeting with the International Brotherhood of Electrical Workers (IBEW) to discuss new approaches to working safely. Workers suggested that the new

plant manager's message was, 'if you have a procedure, and it leads you to make a mistake, we'll deal with that. But if you have a procedure that doesn't work, and you work around it and make a mistake, then that is trouble.'

The second worker recounted an instance where a reactor operator made some mistakes during the outage. "He missed a couple of things that should have been flags," he said. "He drained some of the water out of the reactor - a serious issue that management should have recognized," he said. The incident resulted in an NRC investigation. "The company was going to fire this guy. He was a good worker. But (the company's) procedures were all messed up. There were 'work-arounds' that were commonly used," he explained.

After that, there were 13 "stop works," where workers reported that procedures needed to be changed before they could go on. There were only six "stop works" in months prior, but thirteen after the reactor incident. "Upper management said we have the same processes and procedures as other plants, so why aren't we successful?" this worker recalled. "Now they are beginning to understand." In the end, the worker who made mistakes was not fired, but he will work through a probationary period. "The guy has a long way to go to get back to where he was before in terms of job responsibilities," this worker explained. "But it was important that his job was saved. It was good for management too because he was a good employee. They want people to come back and tell when a procedure isn't right, and this reinforces this message. Had he been fired, it would have sent a message that conflicted with their stated goals of getting people to report problems with procedures, and shared accountability between workers and management."

As this second worker recounted the incident, he acknowledged it would be costly to make the changes recommended by the NRC as a result of their investigation. It results in "more and more oversight when something like this happens," he explained, "from both NRC and

INPO.” He believed it could become difficult to operate the plant under such a heavy level of scrutiny. He went on to explain the role of INPO as he understood it. INPO conducts analysis of incidents or near misses, and develops lessons learned and voluntary measures for addressing deficiencies. In addition, INPO provides a rating of each nuclear operator, which is considered proprietary information. Columbia Generating plant, he believed, was very near the bottom of INPO’s ratings of the 104 nuclear reactors, although he recalled they had previously been in the top quartile. He believed that INPO’s ratings affect NRC oversight, so ratings are important to the power generators.

Overall, both workers emphasized their view that commercial plants, and their plant specifically, operate safely despite low INPO ratings. The first worker believed that the Columbia Generating plant faces more regulation than activities overseen by DOE. His perception is that the commercial plant has more specifications to follow, but also gets more work done. Safety, he reckoned, results from the redundant systems – both technical and human – at the plant. During his time at Columbia Generating plant, he had taken “trips” to assist at five other plants during refueling outages, which gave him the opportunity to see how things were done in other places, and to network with others. He believes that the nuclear plants generally want to work safely, and said he felt very secure in his role at the Columbia Generating plant. When I asked if that was due to his role as a union steward, he answered thoughtfully. “Partly,” he said. But he also believed that the company doesn’t want to cause problems, either within or outside the company. He believed it just wants to focus attention on production. “We all have the same goals,” he said.

In May of 2012, the NRC granted a license renewal for the Columbia Generating Station, approving the 2,200 pages of application documents and concluding a five-year process. Then-

Governor Chris Gregoire attended the ceremony in Richland, then toured the plant to thank workers “for all you have done to make this day possible.”³⁴ Senator Patty Murray (D-WA) and Representative Doc Hastings (R-WA) also praised the renewal.

Conclusion

This chapter shows that law doesn’t necessarily take the shape outlined in statutes. Once legal language moves off the page and into the realities of competing organizational priorities, daily work practices, and human interactions, it takes on its own meaning.

A worker’s decision about whether to raise concerns comes not from his or her knowledge of specific legal rights, but from an overall sense of inclusion in workplace decision-making and the value of dissent. Formal processes such as databases for tracking safety issues, and Employee Concerns Programs create an expectation that workers should raise concerns. But as we have seen from the comments of workers in this chapter, these can become hollow processes, unused and mistrusted by workers.

Workers instead look to the financial incentives outlined in contracts and collective bargaining agreements, signals from managers about how to balance safety with production, and observations about how others are treated after raising concerns. Their decisions are influenced by immediate supervisors, signals from senior management, and a history of attitudes and practices that have evolved over time at a place like Hanford.

Their decisions are not limited to internal cues. Workers also base their decisions on an analysis of the external pressures on their organization at any given time. As worker interviews

³⁴ Tu Decides <http://tudecidesmedia.com/political-civic-leaders-celebrate-columbia-generating-stations-lice-p3641-128.htm>, accessed July 23, 2014

suggest, their decision-making takes into account attention by members of the public, elected officials, and oversight agencies. They recognize external pressures such as license renewals, Congressional funding schemes, and the relationships between their organization and its regulators. While workers have a clear sense of the overall value of dissent, they seem to arrive at this understanding not by a systematic ranking of each of these factors, but their cumulative effect.

And not every worker has the same understanding or perception within a given organization. On the one hand, some workers have suffered life-changing illnesses due to exposure to vapors in the tank farms, while others say that too many precautions interrupt work. Some distrust their organization, the union, or regulators, while others are sympathetic to the challenges of working on technically complex issues in a political environment. Others may simply appreciate a high-paying job at a site like Hanford, and figure their employer and government regulators are watching out for their safety.

Workers interviewed for this study are inclined to be active participants in an organization's commitment to safety – whether because of a near miss experience, serving as a union steward, or a general sense of responsibility to look out for fellow workers and the environment. Their willingness to raise concerns varies based on the complex set of considerations described above, and may vary over time. But always, their understanding of the value of dissent is refracted and interpreted through their own organizations. It is not the letter of whistleblower protection laws that guides their decision-making, but a complex set of factors, derived from multiple layers of influence, that converges within the context of their organization and informs individual action.

Chapter Seven

CONCLUSION

“A decision about whether to remain silent isn’t so much about law as it is about all the forces at play and the terrain it forms.”

A Hanford Worker

The workers and managers interviewed for this study provided a window into organizational life at Hanford. As one worker noted, the value of dissent is not understood simply as a legal right, but rather as a terrain shaped by multiple forces affecting individual decisions and action. Based on their accounts, it is evident that factors closest to workers are most influential. For example, the positive reactions and responsiveness of immediate supervisors, support of union stewards, presence of safety committees, and daily practices such as peer observation, maintaining top ten lists, and “no name, no blame” routines support an environment that encourages questioning and dissent.

On the other hand, I also observed the influence of external pressures that quelled dissent. Although the Columbia Generation Station had a relatively sound “safety culture,” the number of individuals who felt comfortable raising concerns declined during the licensing and refueling process in 2011. Two formal claims of retaliation were filed with the Department of Labor against Energy Northwest in both 2010 and 2011, while there had been no prior claims since one was filed in 2002.

Similarly in 2010 and 2011, contractors at Hanford faced increasing scrutiny by DOE Headquarters, and GAO investigators, which released critical reports. Funding for the “vit plant” was in play in Congress, and hearings and site visits by the Defense Nuclear Facilities Safety Board raised the level of visibility and scrutiny. Media accounts of Walter Tamosaitis’ case in

outlets such as the *USA Today* and *LA Times*, and revelations of worker injuries in the tank farms led by Seattle's King 5 News brought national attention to challenges at Hanford.

At the same time, formal claims of retaliation increased. In 2010, Walt Tamosaitis filed a claim against URS, and two claims were filed against WRPS. In 2011, four claims were filed against WRPS. These numbers constitute a marked increase over prior years. The correlations suggest that increased oversight, and heightened public and media attention changed how workers perceived the value of dissent, and how their organizations responded to it.

The evidence in this study supports the framework presented in the introduction, of nested layers of influences surrounding and enveloping workers and their decisions about whether to raise concerns or remain silent. Immediate supervisors and daily routines created the most immediate influence, followed by formal policies and processes. But external influences such as regulatory rules and oversight, claims adjudication processes, and political and societal sentiments also pervaded decision-making priorities and perceptions inside the study organizations.

In response to Congressional statutes, administrative interpretations, and court rulings, organizations established formal processes for raising concerns. But when political and production pressures increased, the processes and practices put in place to support workers who raise concerns became hollow at best, or circumvented or dismantled at worst.

This study shows that the formal processes such as Employee Concerns Programs developed in response legal mandates may bring an end to the most obvious forms of discrimination or retaliation. These results are likely to come about over time, as organizations adopt new policies and articulate values for how concerns and the people who raise them will be treated. These changes bring about new behaviors, and perhaps more importantly, new

expectations about how people - their perspectives, expertise, and voice - will be treated in the workplace.

At the same time, these processes require that an individual come forward and report outside their chain of command and daily routines. This requires an extraordinary action that goes against human instincts for inclusion in peer groups and direct supervisors. Although these are internal mechanisms for reporting and adjudicating claims, they are similar to external mechanisms that make the worker feel like a victim who has been unable to resolve concerns through the normal channels. In that way, new policies and processes such as ECPs may only perpetuate an existing imbalance of power between workers and their organizations, driving discrimination to a deeper and more subtle level within organizations.

Both types of outcomes may be true at the same time depending on the issue being raised or other extra-legal influences. Similarly, there may also be variation across or within organizations over time. Based on an examination of statutory whistleblower protections for workers at nuclear sites, which have remained relatively constant over the past 40 years, we can assume that variation in legal practice is not due to changes in statutory law.

Instead, this study attributes variation to the ways in which law transforms (or fails to) the heuristics and decision processes of an organization. Legal protections for raising concerns appear to be most powerful not as an external force, but as they are infused within daily practices such as “reverse briefings” (where workers identify risks and demonstrate to supervisors how they have been mitigated), “no blame” peer observations, and safety councils. In these interactions, identifying problems and raising concerns are expected behaviors. These practices help overcome human instincts or simple heuristics that assign blame or personal motivations for raising concerns, and prompt an examination of the issue rather than the person raising it.

Internal Review Boards and analyses of past accidents brings to life the possibility of a catastrophic accident, which helps overcome a natural instinct to discount a concern raised about the possibility of a low probability, but high-impact event. Safety councils and Internal Review Boards break down group dynamics in part because they bring together front-line workers from different crafts, union stewards, engineers, and senior managers. Each brings differing perspectives with the expectation of examining risks, solutions, and lessons learned together.

Interviews conducted for this study also noted the importance of the regulatory craft employed by the DOE and NRC. A combination of rule-making, investigations, and sanctions, as well as efforts to foster and assess the “safety conscious work environment” within regulated organizations has made a positive difference in individual expectations and norms. On the other hand, the case of Walt Tamosaitis illustrates an instance where regulatory authority is weak, or perhaps even complicit in prioritizing production over safety. These findings suggest that regulatory strategies that focus on affecting the daily routines and norms within regulated entities can be a powerful force for change.

Another important influence identified in this study is the industry group INPO. In addition to providing training and assessment materials, it plays an important role in analyzing near-miss accidents and incidents. INPO provides outside technical expertise and analysis, but it also alters norms that work against dissent. For example, routine reporting without regulatory consequences can alter human tendencies to not report a mistake out of a desire to avoid blame, or to keep mistakes hidden from those higher up in the chain of command.

Taken together, the insights gained as a result of this study suggest that whistleblower protection laws have been transformative in the workplace in many positive ways. These formal legal protections have resulted in changes in the kinds of daily routines and work practices

described above, and the emergence of new internal structures for resolving concerns. Changes in formal policies and actions by senior executives have also created a tacit expectation on the part of workers that a questioning attitude and raising concerns is valued.

The regulatory agencies overseeing nuclear activities have also brought about change as a result of their efforts to interpret and enforce whistleblower protection laws. Through contracts, licensing agreements, contract provisions, rule-making, inspections, investigations, and technical support, these agencies have contributed to a “safety conscious work environment” in the nuclear industry.

The record of formal claims of retaliation filed with the Department of Labor suggests that the Hanford site, and the nuclear industry more broadly, is less than perfect. However, a comparison with the number of claims filed within other industries indicates that the nuclear industry and oversight agencies are making a difference. Finally, the record of safety at commercial nuclear sites in particular, is important to note. These results have prompted whistleblower advocates, corporate attorneys, and analysts to suggest that there are many useful lessons to be learned from the nuclear industry’s approach to protecting whistleblowers and encouraging dissent.³⁵

These observations hold practical implications for the policy and practice of promoting workers’ willingness to speak out. A worker’s understanding of the politics of dissent within their organizations depends on much more than statutory law outlining formal individual rights. This study has shown that regulatory oversight, industry organizations, and public expectations for safe operations influence the ways in which law becomes embedded as legal practice within organizations. It is the combination of legal and extra-legal influences that determine whether

³⁵ Discussion at an informal advisory meeting at the Department of Labor in December 2011.

and how formal whistleblower protections become an intrinsic or endogenous force within an organization's decision processes, norms, perceptions of rights, and everyday work practices. While the strength of the statutory language may be an important factor, the implication is that there are other ways to affect practices that encourage dissent within organizations.

This conception of law challenges that there is or can be a pure embodiment of statutory law. Rather, it suggests that law in practice is what law is and all that law can be. Viewing law not in its abstract or statutory form, and without the expectation that there can ever be pure compliance, allows for closer consideration of the factors that affect how law is practiced and its practical effects in the workplace.

APPENDIX I: LIST OF ACRONYMS

AEC	Atomic Energy Commission
BNFL	British Nuclear Fuels Limited
BNI	Bechtel National Inc.
CHPRC	CH2M HILL Plateau Remediation Company
DOE	Department of Energy
DOE HQ	Department of Energy Headquarters
DOE-ORP	Department of Energy – Office of River Protection
DOE-RL	Department of Energy, Richland Office
DOL	Department of Labor
DNFSB	Defense Nuclear Facilities Safety Board
DPO	Differing Profession Opinion
ECP	Employee Concerns Programs
ERA	Energy Reorganization Act
GAO	Government Accountability Office
HAMTC	Hanford Atomic Metal Trades Council
HCC	Hanford Concerns Council
IBEW	International Brotherhood of Electrical Workers
INPO	Institute of Nuclear Power Operations
IRB	Internal Review Board
ISM	Integrated Safety Management
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission

OSHA	Occupational Safety and Health Administration
PER	Problem Evaluation Request
PFPP	Plutonium Finishing Plant
PNNL	Pacific Northwest National Laboratory
SCWE	Safety Conscious Work Environment
SRS	Savannah River Site
URS	URS Corporation
USQ	Un-reviewed Safety Question
VPP	Voluntary Protection Program
WCH	Washington Closure Hanford
WRPS	Washington River Protection Solutions
WPPSS	Washington Public Power Supply Systems
WTP	Waste Treatment Plant, vitrification plant, or “vit plant”

APPENDIX II: RESEARCH JOURNAL

March 1-3, 2011

- Archival research at the DOE Public Reading Room
Richland, WA

June 20-24, 2011

- Meetings re letters of support for Institutional Review Board application
Richland, WA

September 9, 2011

- Hanford Advisory Board Meeting
Seattle, WA

September 14, 2011

- Attended by phone the Hanford Advisory Board, Health and Safety and Environmental Protection Committee Meeting
Edmonds, WA

September 20, 2011

- Meeting with retired Hanford worker
Richland, WA

September 21, 2011

- Meeting with current Hanford worker
Kennewick, WA

September 22, 2011

- Meeting with current Hanford worker
Richland, WA

September 26, 2011

- Meeting with Hanford Atomic Metals Trade Council (union)
Richland, WA

September 27, 2011

- Meeting with current Hanford worker
Richland, WA

September 28, 2011

- Meeting with current Hanford worker
Richland, WA

September 29, 2011

- Meeting with current Hanford manager
Richland, WA

October 4, 2011

- Meeting with current Hanford worker
Kennewick, WA

October 5, 2011

- Attended Hanford Advisory Board (HAB) Meeting, Committee on Health, Safety and Environmental Protection
- Meeting with retired DOE manager
- Meeting with International Brotherhood of Electrical Workers (union)
- Meeting with current Hanford employee
Richland and Kennewick, WA

October 6, 2011

- Attended Hanford Advisory Board Meeting, Committee on Tank Waste
Richland, WA

October 18, 2011

- Meeting with HAMTC union training director
- Meeting with current Energy Northwest Worker
Richland, WA

October 19, 2011

- Meeting with Energy Northwest manager
- Meeting with current Energy Northwest employee
Richland, WA

October 24, 2011

- Meeting with current Hanford manager
Richland, WA

November 14, 2011

- Call and follow up e-mail exchange with NRC Region IV Public Information Officer
Edmonds, WA

November 18, 2011

- Meeting with current Hanford worker
Richland, WA

December 5, 2011

- Meeting with former nuclear advocate, legislative staff, and manager at DOE HQ
Washington D.C.

December 6, 2011

- Attended Senate Subcommittee hearing on Senate Bill 241, proposing stronger whistleblower protections for employees of government contractors
Washington D.C.

December 7, 2011

- Attended an informal meeting with David Michaels, Assistant Secretary of Labor for OSHA and staff, regarding processes for investigating and adjudicating whistleblower claims
Washington D.C.

December 8, 2011

- Visited the Public Document Room at the Nuclear Regulatory Commission Headquarters
Rockville, Maryland

December 15, 2011

- Telephone interview with expert in the field of nuclear and industrial safety
Edmonds, WA

February 9, 2012

- Attended by phone the Hanford Advisory Board Meeting, sounding board discussion on safety culture at the Waste Treatment Plant
Edmonds, WA

February 14, 2012

- Attended by phone a meeting of the HAB Health, Safety and Environmental Protection committee
- Discussion about safety culture, PER system, Employee Concerns Program, and a presentation by Glen Podonsky, DOE's Chief Health, Safety and Security Officer on the HSS Report
Edmonds, WA

March 5, 2012

-Telephone interview with a former senior manager at Hanford
Edmonds, WA

March 8, 2012

-Attended by phone the afternoon portion of the HAB Health, Safety and Environmental Protection subcommittee regarding safety culture
Edmonds, WA

April 10, 2012

-Took a full day tour of the Hanford site, including B reactor (the first plutonium production plant in the world), including briefings by current Hanford and Department of Energy employees
Richland, WA

April 26, 2012

- Interview with current manager at the Hanford site
Richland, WA

May 3, 2012

- Meeting with retired regulator from Department of Ecology
Oregon

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