

# Worker Alienation and Compensation at the Savannah River Site

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## Abstract

Corporations operating U.S. nuclear weapons plants for the federal government began tracking occupational exposures to ionizing radiation in 1943. However, workers, scholars, and policy makers have questioned the accuracy and completeness of radiation monitoring and its capacity to provide a basis for workers' compensation. We use interviews to explore the limitations of broad-scale, corporate epidemiological surveillance through worker accounts from the Savannah River Site nuclear weapons plant. Interviewees report inadequate monitoring, overbearing surveillance, limited venues to access medical support and exposure records, and administrative failure to report radiation and other exposures at the plant. The alienation of workers from their records and toil is relevant to worker compensation programs and the accuracy of radiation dose measurements used in epidemiologic studies of occupational radiation exposures at the Savannah River Site and other weapons plants.

## Keywords

ionizing radiation, nuclear weapons, EEOICP, Savannah River Site, occupational health

## Introduction

From its inception, the nuclear weapons complex has been a corporate and state endeavor. Full-scale development, testing, and production of nuclear weapons in the United States began during World War II under the top-secret Manhattan Project. After the war, contractors built dozens of industrial sites to further develop the nuclear weapons program, as the country amassed an arsenal of

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over 70,000 nuclear weapons. Among the most dangerous were those producing plutonium: the Hanford Reservation near Richland, Washington, and the Savannah River Site (SRS) near Aiken, South Carolina.<sup>1</sup> The sites have similar histories: thousands of people were relocated for their initial construction in the 1940s and 1950s; the local populations were rural and poor; and they offered ample water supplies to support the sprawling facilities. E.I. Du Pont de Nemours and Company, under contract with the Atomic Energy Commission (now the Department of Energy [DOE]), constructed and operated these vast sites. Hanford stretches 586 square miles and the SRS 310 square miles.

Today, the ecological and human health impacts of such operations are widely known. Hanford and SRS have been designated by the Environmental Protection Agency (EPA) as Superfund sites, meaning that hazardous contamination poses risks to human health or the environment. Since SRS began operations in 1951, it has shipped plutonium, processed used reactor fuel, and later in 1955, produced tritium used in thermonuclear (fusion) weapons. SRS production facilities included five large nuclear reactors, two chemical separation areas, a heavy water extraction plant, nuclear fuel and target fabrication plants, smaller test reactors, power plants, and laboratories. Du Pont, which operated SRS until 1989, hired more than 10,000 workers during its first decade of operation.<sup>2</sup> Although the total number of employees at SRS (including subcontractors) is uncertain, Du Pont hired 21,204 workers between 1950 and 1986.<sup>2,3</sup> Of these workers, 18,883 have complete demographic information that has been used in epidemiologic studies. Today, the SRS, now operated by Savannah River Nuclear Solutions, a limited liability corporation owned by another series of corporations, Fluor, Newport News Nuclear, and Honeywell, employs 12,000 workers and operates on an annual budget of around two billion.<sup>4</sup> Currently under construction at SRS is a Mixed Oxide Fuel Fabrication Facility that uses weapon-grade plutonium to form fuel pellets for reactor fuel at domestic nuclear power plants.<sup>5</sup>

Early Manhattan Project scientists knew that nuclear weapons production would entail serious occupational hazards, and set up health physics programs to monitor workers' radiation exposures.<sup>1</sup> Monitoring at SRS was conducted within health physics areas<sup>3</sup> with procedures similar to those developed at the Oak Ridge, Hanford, and Los Alamos nuclear weapons plants, and used throughout the nuclear weapons complex. Although external penetrating radiation monitoring was more complete at SRS than at some other nuclear weapons plants, women were less often monitored than men.<sup>2</sup> In addition to ionizing radiation, workers at SRS were potentially exposed to nonradiological hazards including solvents, asbestos, acids, and hydrazine.<sup>3</sup>

At a 1984 United States DOE and contractor conference on Occupational Safety and Health, Du Pont employee William E. Fayerweather laid out the company's strategy for collecting epidemiological data at the Savannah River Plant, later renamed SRS.<sup>6</sup> SRS faced criticism amongst the public and some

scientists about the adequacy of monitoring and safety standards. In response to scrutiny, the company's corporate Epidemiology Section developed an approach to epidemiological data collection intended to satiate critics' and the public's desire for more evidence, while simultaneously promoting, rather than testing, the efficacy of current standards. Fayerweather justified the research by writing that it would: "*Confirm* the adequacy of current occupational health standards and practices" (emphasis added to all quotes).<sup>6</sup> He further claimed the project would: "*Demonstrate* that the health effects, if any, are so small that they cannot be measured."<sup>6</sup> Another justification of the program was to "*Rule out* the kind of radical increase in health problems that is feared by some members of the public and that has been predicted by certain *extreme* members of the scientific community."<sup>6</sup> These presumed results of the research, Fayerweather promised, would "demonstrate a sense of social responsibility" to workers and surrounding community members.<sup>6</sup> In part, DuPont's focus on confirming, rather than questioning, workplace safety comes as little surprise. Nuclear weapons work has long demanded secrecy and a closing of ranks as part of the discourse of patriotism.<sup>7</sup> In addition, the money and jobs at stake in such operations is monumental.

Conduct of worker health studies by the employer that is responsible for workers' exposures and radiation protection, and that profits from plant operations, presents a potential conflict-of-interest in the collection and dissemination of exposure and medical records, as Fayerweather's programmatic justification demonstrates. However, at SRS, as in all other nuclear weapons plants, the employer is the primary source of documents on occupational exposures that are used in epidemiological studies and for consideration of workers' compensation claims.

Despite the challenges endemic to data collection by contract operators, few other data sources are available. Existing studies that make use of worker interviews typically take place within DOE approved projects and relate to specific exposures, again presenting the same issues accompanying state oversight and corporate management.<sup>8</sup> In addition, such projects hone in on workers with diseases, such as chronic beryllium at the weapons facility in Oak Ridge, Tennessee, identified through existing data. Then, structured exposure interviews are used to better understand risk factors that contribute to the disease.<sup>8</sup> Similarly, a nested case-control study of leukemia among Chernobyl cleanup workers selected participants based on their disease and then used structured interviews to evaluate exposures.<sup>9</sup> Epidemiologic studies of occupational exposures typically rely on rosters and exposure records kept by employers.<sup>10-12</sup> In a rare reversal of this approach, a study of the nuclear weapons plants at Oak Ridge, Tennessee, began in the community to interview workers, residents, and activists about contestation around illnesses.<sup>13,14</sup> Workers reported that corporate operators and contract physicians were dismissive of their concerns by strategically framing illness as an individual problem, restricting information to experts, and using secrecy to withhold information.<sup>13,14</sup>

To our knowledge, there are no interview-based analyses of worker exposure at the SRS. We use interviews with thirteen former plant workers and one family member of a deceased SRS worker (a total of fourteen interviews) to describe aspects of worker exposure and conditions at the plant that are not accessible through employer-based records. Our findings suggest frustration with the bureaucratic structure and surveillance at SRS, inadequate monitoring, inaccessibility to exposure records, and isolation from sample collecting and results.

The significance of this study is three-fold. For researchers, worker narratives provide a more nuanced understanding of exposure and existing data limitations in Fayerweather's File. For workers, interviews provide examples of how problems with official records affect illness compensation decisions. For administrators of the Energy Employees Occupational Illness Compensation Program (EEOICP), worker testimonies can inform program implementation and help provide critical perspectives on the accuracy of radiation dose estimates used in epidemiologic studies of occupational radiation exposures at SRS and other weapons plants. Since 2001, EEOICP has offered the possibility of financial compensation to nuclear weapons workers with medical expenses for chronic silicosis, beryllium sensitivity, chronic beryllium disease, or one of twenty-two cancer types whose dose reconstructions result in estimated radiation doses above thresholds determined by the government. If the department determines that there is a 50 percent chance or more that a person's cancer was caused by occupational exposure to ionizing radiation, the worker or worker's family may be awarded a one-time payment of \$150,000.<sup>15</sup> The formal mission of the program: "... is to deliver benefits to eligible employees and former employees of the DOE, its contractors and subcontractors or to certain survivors of such individuals..."<sup>16</sup>

All epidemiologic studies of nuclear weapons facilities, as well as the EEOICP program for sites and time periods with more complete records, rely on employers' exposure records to estimate radiation doses. However, occupational illness claims for workers employed at some sites and time periods do not require individual dose estimates due to the inadequacy of exposure records; in those situations, workers may be presumed to be exposed. These workers are classified as members of "special exposure cohorts" for the purposes of the EEOICP because records of radiation doses are not sufficient for dose reconstruction. A petition has been filed to include workers employed at SRS between 1953 and September 30, 1972 in a special exposure cohort.<sup>17</sup> The interviews presented here provide a glimpse into some of the data gaps in EEOICP data collection and an alternative method to reconstruct exposure.

In addition to important contributions for worker compensation and researcher data sources, our findings reveal broader problems with participation endemic to the structure of nuclear operations. We end by suggesting participatory research as a method to overcome the culture of silence, alienation, suspicion, and misinformation. We caution, though, that any such project requires leadership from

researchers disentangled from formal DOE and contractor employment. Such a check serves to counter tendencies toward disempowerment and distrust within the nuclear complex by maintaining data collection outside of it.

## Methods

This paper bases interview analysis and data collection on a grounded theoretical approach. Grounded theory refers to inductive research, where initial collection of data drives hypotheses, theoretical framing, and later conclusions. Through induction, grounded theory frames exploration of how actors “respond to changing conditions and to the consequences of their actions.”<sup>18</sup> Simultaneously, the process utilized here is also deductive, moving from individual interviews back to broader issues of data collection to document how worker accounts speak to issues in the broader body of research.<sup>19</sup>

Ashwood, responsible for data collection and analysis, used this approach in her ethnographic analysis of the area across the river from SRS that hosts the Vogtle Nuclear Power plant in Burke County, Georgia. While living in the community from 2012 to 2013, residents related SRS to their distrust of government and concerns about hazardous exposures. SRS became a topic that residents interwove with their understanding of Vogtle, its initial construction, operations, and consequences. Following the grounded theoretical tradition, workers and issues of exposure were incorporated into the research project. Snowball sampling led to additional names of SRS workers, in addition to meeting workers independent of this collection method while living in the region.

A semi-structured interviewing method drew on standard questions about exposure and access to records, but also encouraged participants to lead the direction of the interview by allowing divergent questions to arise based on the content shared. Participants were interviewed at their workplaces, at their homes, and in restaurants. Some workers feared their identity becoming known to du Pont or the DOE and did not want to be recorded. As a result, we draw on note taking for some of the interviews. We distinguish the presentation of data that came from a recording with double quotes and data from notes with single quotes. To ensure the accuracy of the note taking when recordings were unavailable, particularly in light of the technical nature of the information, the parts of the interviews included in the paper were shared with interviewees to check their accuracy. Unavailability of further research funding, limited access to additional SRS workers, and theoretical saturation constrained further data collection. This project received institutional review board approval, and informed oral consent was obtained from each interviewee.

Interviewees presented in this paper reflect the results of thematic analysis. Fields notes and transcripts were analyzed through open coding for overlapping themes. Open coding consists of analyzing the data at a minute, sentence-by-sentence level, interrupting the coding to take theoretical notes,

and determining the analytical relevance of statements once the analysis is concluded.<sup>20</sup> Through these steps, overlapping themes were identified that structure the results and discussion in the paper. These themes are used to draw conclusions about workers' experiences related to their exposures to hazards, their treatment by their employers, and their concerns regarding exposure, health, and compensation. The segments from eight of the fourteen interviews selected for presentation in this paper most vividly represent these themes.

Interviewees included in this paper were provided the opportunity to review the material presented here to ensure their comfort with anonymity. Some interviewees requested that specific details that could lead to their identification, such as the area they worked in and the specific time period, be excluded from this manuscript. To protect all participants' anonymity, even when they did not request it, we have excluded specific time and place details of plant work, and also use pseudonyms. We use plausible deniability as an additional step of protection for participants, where we fabricate characteristics ascribed to the interviewee. The characteristics do not weigh on the validity of the findings, but in the case that a worker was approached about her or his participation in this study, he or she could use that characteristic to prevent their identification. We leave such characteristics unidentified to protect the interviewee's identity, which is paramount to our purpose.

Interviews provide documentation of individual experiences in the context of work and health.<sup>21</sup> To document the individual experience in dialogue with work constraints, we use workers' descriptions of scenes to understand the institutional structure, rather than disjoining quotes from place. This helps create an understanding of the situations that lead to accurate collection and accounting of exposure. Our presentation of interviews reflects actual spacing and pace, rather than using block quotes that break narrative rhythm. In addition, this presentation choice facilitates the dissemination of this article outside of the academic setting.

## **Results**

The fourteen interviews took place between May 2012 and March 2013. Interviews ranged between two and five hours. We identified three predominant themes in worker interviews: (1) the pressures born by workers to keep silent about their exposure, expressed by fourteen interviewees; and their difficulty in obtaining exposure records, expressed by nine interviewees; (2) worker alienation from collection of samples and understanding exposure measurement, expressed by thirteen interviewees; (3) death or surveillance shaping workers' understanding of their employer as deceitful, shared by fourteen interviewees; and as part of this third theme, ten interviewees understood EEOICP compensation and evaluation of exposure to be insufficient.

### *Theme 1: Silence and Inaccessibility*

Workers expressed difficulty in accessing their own exposure records from SRS. Similar accounts have been given by workers at the federal Oak Ridge Nuclear Reservation in Tennessee, where workers describe being denied reports and falsification of their medical records.<sup>13,14</sup> Similarly at SRS, our interviews suggest that the institutional culture discouraged complaints about exposure, and workers who did experience exposure were subjected to a climate of shame. As a result, they downplayed their exposure. During four years of working in maintenance at SRS, Jim recounted one such exposure to radioactive material. Jim, who lives in South Carolina, was one month out of training when his boss requested that he fix a motor. Jim was not informed what the motor was intended for, but he did his best to repair the damage. His initial attempt failed, and later he had to go into a high radiation zone to fix it.

“So I started dressing up,” Jim said. “The first thing you do is put on a white jump suit, the cotton gloves, and a white hoodie. You have a person in HP, health protection, assisting you getting dressed, because you need help. As you dress, you have to be taped. You need to learn how to take your gloves off and not spread that contamination. Because it is there.”<sup>a</sup>

“You can’t see it, you can’t taste it, feel it,” he said. “But it is there. Through all that, you have got nine wire, sticking out of a motor, that you’ve got to cut, strip, read a number on it, and then wire it back up like it’s supposed to be. [The HP man] opened that door, and he pushed me in and he said, ‘You’ve got two minutes.’ Before you can kind of swallow, and reality sits in of what you’re fixing to do, your hands already are sweating in your gloves. It’s like working with two water balloons on your hands. I went in there, and I rewired it. But it didn’t work, so all of that was for nothing. And I couldn’t for the life of me, ever really understand how I got pricked on the finger by a piece of the copper that stuck through the glove, just a strand of wire.”

“It scared me to death. And it is that finger right there,” he said, pointing with the finger that was pricked. “And I’ve got a little sea wart, kind of like on the end of it. And I can feel it right now,” he said, rubbing his thumb against the tip of his finger. “And it’s taken three operations to get some of it out.”

Each interviewee included stories of his or her own exposure. Workers fear that these exposures will someday serve as the seed of illness. For Jim, his insecurity has mounted because he was refused his exposure records after he left SRS in the mid-1980s.

Grace began working at SRS when affirmative action policies were implemented, allowing for the hiring of more women in the 1970s.<sup>2</sup> Grace commuted daily from Georgia to SRS, where she tested and diluted radioactive samples. By the time the sample reached the final stage where Grace worked at the bench, the sample had been diluted several times so she then could begin her work of making sample plates for someone else to measure for contamination. One shift, Grace had a severe uptake.

'I went through it a million times in my head,' Grace said 'I was working with a sample that had gone through two stages of dilution, with the manipulator and the glove box. I took every possible precaution while putting the sample on the plate. It was only on my way out of the door, when I was exiting the room, that I registered an uptake.'

'Of course [SRS management] are going to blame you,' she said 'I thought it was my fault. I was so young and naïve. I thought that I had done something wrong. It was one of those things that I had to write up a million times for information. I was called into one meeting after another. They would demand I recount what happened. I would continually go over the process, over and over again. I have no idea how many times. You feel like a criminal or something. Now I realize that the room could have been contaminated when I entered, which caused the uptake. They did not have enough monitoring equipment.'

After Grace's exposure, SRS installed monitoring equipment at each station where she worked. Grace only concluded in retrospect that they might have taken these extra safety measures because of what happened to her. At the time, she was blamed for her uptake.

'They just sent you away, like it was your fault,' she said. 'I was sent to the medical doctor and they gave me pills to take. I was scrubbed down. It was so humiliating. So embarrassing. They all said, 'hush, hush.' I was too intimidated to ask any questions. I did not know what was going on. I thought that if I pretended like this never happened, that this nightmare would stop. They would ask you the questions about what happened, and click their tongue at you, and send you away.'

As a woman, Grace thought her best strategy was to keep quiet and hope that the situation would alleviate itself. Grace believes her gender further elevated the bullying she experienced at the plant and demands for her silence.

'I was everybody's whipping girl,' Grace said. 'Women were not as valued. They had to hire us. I came in an era where a woman had to prove herself. I thank God my daughter doesn't have to prove herself like I did.'

When Grace decided to leave SRS after decades of service, she was well aware of the stories of workers who were denied their records.

'I was wise enough to know that I needed to ask for them before I left. I had heard stories that after you left, if you asked for your exposure records, that you couldn't get them,' she said. 'I knew at that stage I was leaving and I was going to stop working for the company. I was in the right department, in the right building, to get my hands on my records.'

At the time of her interview, Grace said that she had not talked about her experience at SRS since she left the plant in the early 2000s. Our conversation marked the first time she had revisited the event. She had yet to flip through the pages of her exposure charts and check the accuracy of the data. When Grace left SRS, she wanted to put her past work and experience behind her.



When Grace checked the accuracy of the data presented here, she said that after her interview, she went home and examined her exposure charts for the first time since leaving the site. In the documents, she learned that SRS had admitted accountability for the exposure, and said the contamination was already in the room. She had done nothing wrong.

‘Someday, I am going to do something,’ she said. ‘I am going to confront all those people who made me feel like it is my fault and ask them, why? Why did you make me believe it was my fault for all those years?’

## *Theme 2: Worker Alienation*

Workers resented their employer’s failure to share sampling results and disseminate information about exposure standards and methods as part of health services. Mary detailed how during her few years working at SRS she was unable to access test results from samples that she collected. While working for the site’s environmental group in the late 1970s, some days she would pull on a pair of big snake boots and wade out into the swamp and assess environmental contamination. She said some of the men resented her working with them outside, but others capitalized on her sharp note-taking skills. She related that the most frustrating aspect of her work was never knowing what she was a part of, being privy to the risks associated with her work, and understanding what role her efforts played in the larger SRS agenda.

‘You knew what you were testing,’ she said, ‘like a plant or animal, but you didn’t know why. You were simply a technician. My part was just to gather samples. Someone else would then come along and test it, and read that result. It was not that I was ignorant. I love to see the whole picture. I guess it is because you had different areas of expertise. You were basically a secretary.’

Responding to a question about receiving results of sampling, Mary said, ‘No. You only ever had a small part. You never got to see the end results. That’s what I like about this job,’ she said, referencing the new position she had taken after leaving SRS. ‘You can see the end result.’

Mary never knew for herself whether the places that she waded in, or the fish that others ate collected on SRS property, were hazardous. The workers suggested that the bureaucracy at SRS made it difficult to understand the hazards or measurement processes. The process disjointed the risks of sample collection from exposure. As a result, the procedures used to assure worker safety sometimes appeared spurious to the workers they were designed to protect. Lily, a maintenance worker, explained that SRS randomly designated days for whole body counting. Lily, though, interpreted the checks as being performed only on days when management knew there was contamination present, although they told the workers otherwise.

‘Once, there was a guy in there getting counted by the mobile whole body count unit for his exposure,’ she said. ‘I’m a joker, and I teased him, ‘go back in

there, go back in there,' like he had an uptake. Well, it was a random sampling, supposedly, that they were conducting, and then it was my turn to go through. I went in, and on out, and the guy behind the counter said, 'Stop and step back.' I said, 'haha, right, stop, step back. I know you guys are playing me.' He said again, 'No, ma'am, you need to step back.' The blood drained from my face. I know I went completely white. I stepped back in again, and they said I was over the limit.'

'I know what happened,' said Lily, who worked at SRS for twenty-five years. 'They supposedly had a random whole body count, but in my opinion, it was not random. There had been some kind of a leak. They didn't tell us. We never knew anything. We are always left in the dark, and whatever exposure happened, they may or may not do a whole count.'

When Lily learned that she was over the limit, she assumed that upper management was aware of the exposure and chose not to share the information with workers. She said she learned at upper management meetings, when she filled in for her boss, that the supposedly "random" mobile whole body count units that came into certain areas were sent in because something had gone wrong. Usually, there had been a release that management did not inform the workers about. When such an event happened, she said that they sent in the mobile whole body count units mounted on a truck into the area that experienced the release. The lack of dialogue between different workers at SRS amplified Lily's distrust. She could not know for certain that her testing that day was not random, but she suspected as much because of her experience.

'You know that [the mobile whole body count units] were not there because they picked an area out of a hat,' she explained. 'There had been something that happened that was not reported to us. The only way you would know is if you were in the upper echelon of management.' Lily requested a copy of her exposure records when she left the plant in the early 2000s but had not received it at the time of the interview.

In addition to questioning the integrity of exposure measurements, one worker also reported problems receiving her own medical screening data. Gillian, a painter who retired from SRS after over twenty years of service in the mid-2000s, was invited to participate in an Augusta Building Trades Medical Screening program for the SRS; one of twenty-eight participating DOE or former Atomic Energy Commission sites participating in the program funded by the office of Health, Safety, and Security within DOE. The purpose of the program was to make, "... ongoing medical evaluations available, at no cost, to all former DOE Federal, contractor, and subcontractor workers from all DOE sites."<sup>22</sup>

Gillian received a letter from a variety of key players, welcoming her participation in the study: The Center to Protect Workers' Rights, the Building and Construction Trades Department, AFL-CIO, The Augusta Building and Construction Trades Council, Duke University Medical Center, Mediantic Research Institute, Washington Hospital Center, University of Cincinnati

Medical Center, and Zenith Administrators, Inc. Gillian was convinced that the study was trustworthy because it was led by former International Brotherhood of Electrical Workers Union members who had been exposed to radioactive isotopes to the point that they had been chelated.

'You trusted these people because you thought you could relate to them,' she said. 'We thought they were behind us. It's kind of like how you don't buy a truck off someone who drives a Cadillac. I was out there long enough, and I thought it was legit, so I decided to do it. Our union encouraged us to participate in the study. The union, we later learned, was only after the 5% of our paycheck.'

At her home in South Carolina, Gillian flipped through pages of information that was collected on her as part of the study, from family history to her personal habits.

'I had a lot of asbestos exposures,' she said, 'and I thought I would have x-rays of my chest. But they said, even after I had listed asbestos as an exposure, that I had to be 40-years-old to have the x-ray. At that time I was 39-years-old. They had a 40 standard. I mean, my first job was scraping asbestos off the side of a building. I knew I had tremendous exposure, all throughout my over 20 years of working at the Savannah River Site. Anyway, they did not give me a chest x-ray.'

Even though no X-ray was taken, 'They sent my results back, and they said my chest x-ray was negative,' she said. 'I couldn't believe it. They had not even taken a chest x-ray of me because they said I was too young. And I had listed that one of my exposures was asbestos. You know what I did? They had a call in for comments on the health survey, and I replied: 'Thank you for your bogus health survey.' I never got a thing out of it. It was another cover up, just trying to pretend they were doing something for us, when nothing was happening. They didn't care about our exposures, or getting us the necessary care.'

Gillian was alienated from the data collectors, and her ability to push back was relegated to a phone call. The inaccuracy of the study fuelled her discontent and apathy toward compensation measures. A subcontractor hired from the utility Southern Company also spoke about the arbitrary nature of the safety and health standards at SRS. Matt was hired by the DOE to help SRS implement a quality assessment for the plant's safety program: "because they were operating out of limits. They were just doing whatever they wanted." SRS's resistance to implementing appropriate safety measures left a mark on Matt, who is originally from the Aiken area. He believed the safety measures served to rubber stamp government mandates, rather than achieve meaningful protections for workers. As director of a team, he made sure to counteract what he considered spurious safety plans at SRS: "We had all these double fences around everything," he said. "If they had a release, including radionuclides, and they declared an evacuation, you were supposed to orderly leave the site and have these rally points. They told us in training that we had to go through these turn stops at these crash gates, one-way gates built into the fences, in the case of a release."

“After the training, I went back to the office,” he said, “and I called all my guys together, and I said, ‘Alright. You have had the training. I am going to explain something to you. If we have a problem and we have to evacuate the site, don’t be looking for Matt. Because Matt is not going to be around. You are going to look over there, and you are going to find one of those crash gates, and if you are fast enough, you will see Matt in his truck leaving the site, going home. There ain’t going to be no orderly evacuation, and you do not need to look for Matt at the rally point, because he is not going to be there. You do what you want to do, but I do not trust these guys. I am getting the hell out of here.’”

### *Theme 3: Death, Surveillance, and Compensation*

Experiences of death and surveillance dominated interviewees’ understanding of SRS. For example, Matt said that during his two years subcontracting at the site, many workers would confide in him about the surveillance they were subjected to, the secrecy demanded at the plant, and the fear instilled through plant security measures.

“Du Pont did surveillance on their folks. It was a culture over there, and it started out with this is a bomb, and this is national defense, anything you say can and will be used against you stuff,” Matt said. “They would do things, like go put spies on people at home cutting their grass. If you rocked the boat, the first thing they would do was put spies on you. I know for a fact that the people that were rocking the boat, they would be followed. I was told of this guy on the weekend, who was cutting his grass, and didn’t have his safety glasses on, and the next week at work he got chastised and got a warning that next time he better have his safety glasses on.”

“SRS left the impression that they would come and get [the workers] when I was there,” Matt said. “Wackenhut, the security force, had black helicopters and they’d do these drills and simulations. You could walk outside your office and there’d be a guy with a ski mask on, and an MP5 hunkered down, doing terrorism kind of training at the time.”

Primary and secondary accounts of lethal exposure influence workers’ lives and fears about their own health. For example, Gary, an electrician who worked at SRS for fifteen years and left in the mid-1980s, said, “One guy I worked with took samples of the outfall water from the reactors. He was always complaining about his stomach. He’d have pains. They’d keep coming back, and they got worse.”

“One Monday [he] wasn’t at work,” Gary said. “The doctors had cut him open and sewed him right back up. The cancer had gone too far. There was nothing they could do. Four months later he was dead.” Stella, whose sister now works at SRS, described her participation in the program after her father’s death. After Stella’s father discovered a tumor on his body, his health rapidly deteriorated and he was diagnosed with cancer. Within nine months, he was dead at the age of fifty.

“I call it shut-up money,” Stella said. “We got \$150,000. I think SRS is no good. That little bit of settlement that they offer these families. . . people go out there to earn a living for their families, and this is the thanks they get.”

“Everything is very secretive out there [at SRS],” she continued. “It’s horrible the things that go on out there. [The workers] can’t even talk about what goes on out there. I don’t know if it’s almost like you’re sworn to secrecy or what, but you can’t really discuss how things really go down out there.”

Even her own father, on his deathbed, did not share with her the details of his exposure. Stella has yet to receive her father’s exposure records.

“You have this perfectly healthy man, who had never been sick in his life,” she said. “My daddy was a big man. When he was at his worst, I carried him into my grandma’s for Sunday dinner. You see this man, who was your daddy, brought down to nothing. I later told the DOE lady, and I know she was just doing her job. But I said this little bit of money was nothing for his life.”

## Discussion and Conclusion

Compensation programs are designed and implemented by the government agencies and companies that are ultimately responsible for the nuclear weapons program and for exposing workers to occupational hazards. The completeness of monitoring used to determine compensation has received limited scrutiny from researchers who document administrative decisions that sometimes exclude workers from participating in radiation dosimetry programs: “. . . data entry errors, errors in computerized record linkages, or lost records” persist as a constant limitation to ongoing research at SRS.<sup>3</sup> Increased understanding of and attention to the experiences and perspectives of nuclear weapons plant employees could help increase the fairness of the EEOICP and of other efforts to respond to needs of exposed workers.

EEOICP is widely known to workers and community members. It provides some compensation and recognition of deaths and illness as a result of the nuclear weapons work environment. Yet, workers may not be able to obtain the records that are relevant not only to understanding their own exposures and disease risk, but also to soliciting the Department of Labor for compensation. Despite the exposures that workers reported, only four of fourteen interviewees in this study possessed a copy of exposure records. Similar stories of records being denied have surfaced in the *Washington Post*.<sup>23</sup> Even when receiving compensation from the EEOICP or participating in screening for occupational illness, workers still lack formal reports from SRS on their exposure. Workers who lack exposure records are ill-equipped to pursue compensation from EEOICP and understand their own health risks.

One step in alleviating this problem would be to mandate that every former worker, including subcontractor employees and temporary workers, receives an up-to-date copy of their exposure records and have the opportunity, in person, to contest or support the record. Workers without records or with missing

records should be provided that information and have their own exposure accounts recorded.

Workers are also concerned that the EEOICP will not meet their full medical needs. Grace mentioned that although she had a cancerous tumor that was removed, she did not want to collect a lump-sum payment from EEOICP for fear that she might become sicker and need more money. If her sickness progressed, she wanted to ensure that SRS paid for it because they were responsible for her exposure. Particularly for retired workers who may not have ample health coverage, EEOICP is insufficient.

SRS workers interviewed for this study reported that separation of the collection, analysis, and reporting of exposure data limited their capacity to understand exposures, relationships between exposures and work tasks, and steps they could take to better protect themselves and their co-workers. Workers toil in a bureaucratic work environment that can demand that they remain quiet about uptakes and take responsibility for any exposures. Workers lack venues to question the authority of explanations for their exposure.

Employers' failure to inform workers about connections between their jobs and plant production, as well as workplace hazards, facilitates workers' alienation from the plant's mission. They may consequently violate protocols because they seem spurious. Without active involvement in the making and implementation of safety standards, these rules lose their legitimacy for workers. When workers reported having questions about exposure, they did not describe being offered helpful education or explanation. Workers' isolation along technical elements of the chain of monitoring and construction at the plant increases their vulnerability to exposure and distrust in the plant. Workers are excluded from the big picture understanding of plant operations because knowledge is closely regulated and parceled out by an institution entangled in an overbearing bureaucracy born in the secrecy surrounding the development of the nuclear weapons program. As a consequence, they are less able to participate in protecting themselves and others.

In the long run, this practice is detrimental for both workers and the plant. Skilled workers leave for more fulfilling jobs. If workers were well-informed about onsite pollution and exposure, they would have the knowledge power to suggest better protective measures and improvements in plant operations. Providing workers with knowledge and opportunities for involvement in the workplace could help reduce suspicion and promote investment in the integrity of operations as well as health and safety. It also could help overcome fears of death and deceit at SRS that haunt workers and profoundly shape their experience at the plant. The antagonistic relationship between workers and the plant encourages apathy and disinterest in completing tasks. Connecting radiation monitoring programs with results and critical education about potential risks could help transform ineffective silence into pro-activeness.

The distrust described by workers interviewed for this paper arose out of the way they were treated on the job. Compromised research programs at the inception of

monitoring, like those described by Fayerweather in the introduction to our paper, provided additional reasons for workers to distrust the government agencies and companies involved in nuclear weapons production. A review of early proposals for epidemiologic studies of nuclear weapons workers shows that these studies were funded, in part, because the funders believed they would be unable to identify relationships between radiation and disease.<sup>24</sup> Ironically, some of those studies did end up showing dose-response relationships between workers' radiation doses and cancer mortality, contributing to the justification for the EEOICP.

For occupational health researchers, collecting more primary data could help remedy the knowledge and power imbalance between workers and employers at nuclear weapons sites. In addition to focusing on the dissemination of data,<sup>25</sup> attention to the ways in which it is collected are central to ethical health research. Continuing to base exposure estimates required for compensation on records collected by plant operators and the government will perpetuate worker estrangement, alienation, and distrust. Academics can forge alliances to collect data on plant exposures with workers.<sup>26</sup> Data collection outside of DOE and operator funding, coupled with participatory research within nuclear weapons plants, may help overcome the antagonistic relationship between workers and their employers. If workers are more involved in documenting their own exposures, and they are informed about results and record-keeping throughout the process, they can contribute to creating better records in a way that could reduce mistrust and dissatisfaction with the EEOICP. Simple measures like awareness and participatory space within the plant can help reduce mishaps leading to exposure by cultivating relations of trust that are more ethical.

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### **Note**

a. HP is also an abbreviation for "health physicist" used in radiation protection.

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