



NIOSH Dose Reconstruction Project SEC Worker Outreach Meeting with Former Workers from the Hanford Site

Meeting Date:

March 28, 2007, 5:00 p.m.

Meeting with:

Former Hanford workers from the DuPont era, 1942 to 1946, in Richland, Washington

Attendees:

Name	Organization	Name	Organization
[deleted]	Hanford (Retired)	[deleted]	Hanford (Retired)
[deleted]		[deleted]	Hanford (Retired)
[deleted]	United Steelworkers of America (USW) Local 12-369	[deleted]	Pacific Northwest National Laboratory
[deleted]	USW Local 12-369	[deleted]	Hanford (Retired)
[deleted]	USW – Hanford Atomic Metal Trades Council	[deleted]	Hanford (Retired)
M. Josie Beach	Advisory Board on Radiation and Worker Health (ABRWH)	Dr. Tony James	United States Transuranic and Uranium Registries, Washington State University
[deleted]		Barb Lisk	Office of US Rep. Richard “Doc” Hastings (WA, 4th District)
[deleted]			

NIOSH/ORAU Team:

Sam Glover, PhD – National Institute for Occupational Safety and Health (NIOSH), Office of Compensation Analysis and Support, Health Physicist

Laurie Breyer – NIOSH/OCAS, Special Exposure Cohort (SEC) Petition Counselor

Fred Duncan, Oak Ridge Associated Universities (ORAU) Team, Task 5

Ed Scalsky, ORAU Team, Task 3, Document Owner of the Hanford Site Profile

Mark Lewis, ORAU Team, Task 3, Worker Outreach

Mary Elliott, ORAU Team, Task 3, Worker Outreach

Mary Jo Zacchero, ORAU Team, Senior Advisor

Proceedings:

Mark Lewis opened the meeting at 5:00 p.m. by greeting the attendees and thanking them for coming to the meeting. Mr. Lewis is the Senior Outreach Specialist for the Dose Reconstruction Project for the National Institute for Occupational Safety and Health (NIOSH). He explained that representatives from the NIOSH Office of Compensation Analysis and Support (OCAS) were present to get input for the Special Exposure Cohort (SEC) evaluation report from people who worked at Hanford for DuPont in the early 1940s. Mr. Lewis introduced Dr. Sam Glover, a



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health physicist with NIOSH/OCAS.

Dr. Glover asked the members of the team to introduce themselves. Ms. Josie Beach also introduced herself. She has worked at Hanford for 20 years and is a recent appointee to the Advisory Board on Radiation and Worker Health (ABRWH).

Dr. Glover stated that the handout for the meeting includes contact information for Ms. Laurie Breyer, the SEC Petition Counselor, and Mr. Lewis, the Outreach liaison. He explained that the purpose of the meeting is to get worker input for the SEC petition evaluation report. Dr. Glover explained that a worker must have worked at a site for 250 days and have one of 22 specific cancers to be eligible for an SEC class. If the worker meets the SEC criteria, the claimant is paid without the need for a dose reconstruction. If the worker has not worked for the specified time or does not have one of the 22 specific cancers, then a dose reconstruction is performed to determine if the claim is compensable.

Dr. Glover stated that three SEC petitions have been filed on behalf of three different classes of Hanford workers. To simplify the petition review process, NIOSH is merging the three petitions into one petition with two distinct classes. The initial timeframe is for workers from January 1, 1942 to September 1, 1946 and the second timeframe is for workers from September 1, 1946 to December 31, 1990. The classes for the three original petitions are described below:

- SEC Petition 0050: All workers from January 1, 1942 to September 1, 1946. The principal issues are that DuPont employees' records are lost and environmental release studies are flawed. This class of workers will be evaluated as Part 1 of the merged petition (Petition 57).
- SEC Petition 0057: Originally proposed for all workers in facilities and all areas at the Hanford Reservation from January 1, 1942 to December 31, 1990. The class being evaluated is all employees in all areas and facilities from September 1, 1946 to December 31, 1990. The principal issues are that several employees listed in the petition did not have monitoring records for all periods. This class of workers will be evaluated as Part 2 of Petition 57.
- SEC Petition 0078: All roving maintenance carpenters and apprentice carpenters that worked in the 100, 200, 300 and 400 Areas of Hanford from April 25, 1967 to February 1, 1971. The principal issue is that carpenters and construction workers were not monitored for internal exposure during this time period. This class of workers will become part of Part 2 of the Petition 57.

Other issues are being considered by NIOSH due to recommendations from the Advisory Board on Radiation and Worker Health (ABRWH). All of these issues will be evaluated in the SEC Petition Evaluation Report.

Dr. Glover stated that the primary goal of the meeting was to hear from the workers who have first-hand knowledge of the work practices at Hanford in the 1940s. NIOSH understands that practices in the early days were not the same as modern work practices. A follow-up meeting will be held at a future date to discuss practices from the 1950s through 1990. The meetings are being set up with help from the Hanford unions and retiree groups. He added that anyone from the later time period would be welcome to speak since one of the issues being evaluated is how practices changed over time. Individual claims would not be discussed due to Privacy Act issues.



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Dr. Glover explained that NIOSH is interested in hearing about the practices of the radiation protection program during the early DuPont years, including monitoring practices for internal and external personnel exposure, monitoring in the reactor and plutonium separation facilities, and the frequency of the bioassay and dosimetry badging programs. Other issues of interest to NIOSH are the mobility of the workers within the facility, as well as information regarding incidents and/or accidents. Workers' stories about the daily work environment at Hanford are also appreciated.

Comment from Former Worker #1:

My name is [deleted]. I worked in the 300 Area, most of the time in the fuel production operations, from the time I started working on [deleted], 1944 until I retired in [deleted]. During that time, I worked about every job they had in the fuel production process.

Sam Glover:

When you came to work in 1944, how were things different from when you came to work in 1950?

Response from Former Worker #1:

We had no monitoring of any kind. We didn't even know what we were handling. The word "uranium" was not spoken in those days. We didn't monitor. The only thing that they told us was that we had better wash our hands before we ate because it might be hazardous. We had no radiation monitoring.

I was the first to handle the uranium. I prepared it for extrusion. After it was extruded, it was machined because the fuel rods always had ragged ends. The rods were then put into 30-gallon drums for shipping to Fernald or wherever they were going. Sometimes the rods would catch on fire by themselves. Once we had a railroad car full of it burn up somewhere in Idaho. After that, they had us oxidize all the uranium scrap before we could ship on the railroad.

We set up furnaces in 314 to oxidize the scrap. The uranium oxide would get so thick in the air that the lights would go dim. It would go out around the perimeter and up on top of the I-beams and out of the building. They didn't furnish any respirators or other equipment for protection.

Sam Glover:

Was that before 1948?

Response from Former Worker #1:

Yes, it was before 1948. I think that we started oxidizing the scrap around 1946.

Sam Glover:

Before 1948, they didn't have uranium bioassay. They relied only on air monitoring data before 1948. The conditions that existed would be determined by air monitoring. The period of time is important.

Response from Former Worker #1:

My memory isn't what it used to be. I'm only 85 years old. I worked in that. I also ran the 305 Test Reactor for a couple of years. I worked on the production line that made the first fuel for the reactor. It's all in there someplace. When we first started, we didn't know how to make the fuel so we had to do a lot of experimenting to come up with something that would hold up.

Sam Glover:

That was the fuel for which reactors? Did you say for the first reactors?



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Response from Former Worker #1:

Yes, the first reactor. We had to have the fuel ready by the time they had the reactor built. We put in 10-hour days, six days a week to figure out how to make them. Then we had to get them into production.

The 314 was the worst place to work because the uranium oxide was so thick in the air. We worked around some of the brazing with beryllium oxide, but I have no ill effects from that. For 25 years, I ran the extrusion press and extruded most of the fuels for the N Reactor. I did just about every job they had there. I don't know what else to say. I was injured once in that time.

Sam Glover:

Did they start the canning of the fuels in March 1944? Was that the question?

Response from Former Worker #1:

I blame part of my colon cancer on the uranium part.

Mark Lewis:

Did you have a lunchroom in the uranium facilities or was it separate?

Response from Former Worker #1:

The lunchroom was separate from the uranium facilities, but it was in the same building.

Mark Lewis:

Did people smoke in the uranium facilities?

Response from Former Worker #1:

Yes. They did, but I didn't.

Mark Lewis:

You said you were injured once. How did you get hurt?

Response from Former Worker #1:

A crane came unhooked and hit me right between the eyes. That is the only time that I was injured. Except for something unforeseen, I always tried to be careful.

Sam Glover:

When did you stop working in the uranium facilities? Were you always there?

Response from Former Worker #1:

I was always there.

Sam Glover:

Do you remember when they started the monitoring programs for you?

Response from Former Worker #1:

It seems to me that it was almost 1960 before they started using the film badges and things, but I don't remember just when. We didn't have any monitoring for a long period of time. Under DuPont, there was none. I don't remember when GE (General Electric) started it. The dates escape me, but it seemed like between 1944 and 1964, there wasn't too much monitoring going on.

Ed Scalsky:

Did you ever have to use respirators?

Response from Former Worker #1:

No, I didn't have to wear one. They didn't furnish them.



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Ed Scalsky:

You didn't have to wear one for any of the time that you worked there?

Response from Former Worker #1:

No, I didn't. Later on, I would see people who wore them for other jobs. I'm sure that we ate the uranium oxide in the 314 Building. If you opened your mouth, you were sure to get some in it.

Ed Scalsky:

Were you ever involved in any incidents or were there any problems that required you to be specially monitored in any way?

Response from Former Worker #1:

No, Sir. I used to go out during clean up time, or "burn out time" as they called it, to clean up around the reactors on my overtime.

Ed Scalsky:

Did they provide you with a training program? Were you given any training on how to work with the uranium?

Response from Former Worker #1:

No. They just said, "There it is, do it." When I started, that's the way it was and it was not much different all the way through my employment.

Sam Glover:

In the previous meeting, another former worker spoke briefly about monitoring equipment – hand surveys – in the uranium facility, at least in the areas where he worked. He may have been in a different area.

Response from Former Worker #1:

In the 1980s, my doctors detected that I had colon cancer and they removed several polyps from my colon. One of them was malignant.

Question from an unidentified attendee:

When did they start using hand monitors?

Response from Former Worker #1:

As far as I can remember, that was sometime in the 1960s. Any other questions that might help jog my memory?

Sam Glover:

One of the things that NIOSH has been looking at is historical documentation such as log books to get an idea of what the contamination levels were in the areas. Were you aware of any air sampling during the early years?

Response from Former Worker #1:

No. There was no air sampling in the early times that I knew of. There should have been a lot of it in 314 when we were oxidizing the uranium, but I never saw a unit there. About once a month, we had to run all of those fuel scraps through an autoclave. Then once they had gone through the autoclave, they were dumped into a pit underneath it. We had to go down underneath there and scoop that up. I'm just trying to think back.

I've been waiting quite a while for my claim. There is no history of colon cancer in my family. I had eight brothers. I don't know whether or not that means anything, but I sure had it.



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Sam Glover:

It is hard to say with cancer. It doesn't always strike every generation. It's a probabilistic event.

Response from Former Worker #1:

In the early days, we sometimes didn't know what people died from. Back then, with the hard lives they had, it wasn't unusual for people to die before their seventies or eighties. Most of my relatives have lived fairly long. My grandfather and my mother died at 89. My uncles died in their late eighties.

Sam Glover:

It helps when you get a group together from the same period. Sometimes someone will talk about practices and other things that they remember over time and that will jog another's memory.

Response from Former Worker #1:

I'm not used to talking at meetings, but maybe if someone could ask me some questions to jog my memory I could tell you more.

Mark Lewis:

You talked about cleaning those pits out. Were you badged or monitored then?

Response from Former Worker #1:

No. We wore coveralls, gloves and safety glasses.

Sam Glover:

Sir, we appreciate your sharing your experiences with us. As you said, you don't remember any real monitoring during the 1940s and 1950s. That is useful to us.

Response from Former Worker #1:

I was one of the first ones hired in. I was hired in through the construction employment office for operations, because they didn't have an office set up yet. DuPont hired me to handle the uranium that had started to come in. Each billet would arrive in a wooden box. I took them out of the box, weighed them on the scale, and recorded the weights. That was my first day's work. We had as much as 50 tons of uranium sitting in that building.

Sam Glover:

It's amazing to be hearing this from someone who started the whole process sixty years ago.

Response from Former Worker #1:

Well, we didn't know what we were doing. We just did whatever seemed right.

Ed Scalsky:

You did a good job at it, too.

Response from Former Worker #1:

We managed to get the fuels made for that reactor by the time it was ready for them. We tried everything in the world to make a fuel that would hold up in that reactor before we finally found a process that worked. It was quite a process. To heat them faster, they put molten lead in the furnace and then put 10 inches of aluminum on top of that to keep the uranium from oxidizing so much. They brought the lead up to about 400°, and then they dipped the uranium into the molten lead to heat it up quickly. Then they would wash it in aluminum and insert it into an aluminum can. I may be leaving a lot out, but I don't want to repeat myself too much.

Sam Glover:

We are trying to find out what practices were not done based on your recollection of the day.



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You were there at the very beginning.

Response from Former Worker #1:

I don't know, but I still feel that my work could have caused my cancer. That's all I can say.

Mark Lewis:

You said that they tried everything in the world before they got a fuel that would work. Can you tell us about some of the processes that didn't work?

Response from Former Worker #1:

If they didn't work when you put them under 10 pressure, the uranium would just oxidize.

Mark Lewis:

If they didn't work, was there any more exposure then?

Response from Former Worker #1:

No. There wasn't any more exposure, but it settled in the bottom and I would have to clean it out of the trench underneath the autoclave afterward.

Mark Lewis:

You said before that was done every month. Is that right?

Response from Former Worker #1:

Yes.

Mark Lewis:

Thank you, Sir. That was amazing wasn't it? If you hear someone else say something that rings a bell, please tell us. Can we ask you to talk, Ma'am?

Comment from Former Worker #2:

I'm [deleted]. I worked out there in 1943. I was a messenger girl. I went all around delivering messages. I had a whole mess of bosses. We had a lot of meetings and were told not to say one word about what was going on out there. We weren't even allowed to tell our families. I never said a word for many years. We didn't have any monitors or badges. I don't even think I knew that I was exposed to anything. Back then, they didn't tell you anything.

Mark Lewis:

Does anyone else have a question?

Sam Glover:

Did you enter any of the production areas?

Response from Former Worker #2:

Yes. I walked all over. I tried to get the boss to let me use his car to drive around. He asked if I had a license. When I told him no, he said, "Oh, no. You're not driving my car." They were doing all kinds of construction out there. I worked in the Administration Building doing things for the bosses, too.

Sam Glover:

But you went all over. How long did you work there?

Response from Former Worker #2:

Yes. I wasn't there too long. I quit in 1943, in the fall.

Sam Glover:

Thank you. How about you, Sir?



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Comment from Former Worker #3:

I'm [deleted]. I'm not one of the old timers. I'm only 79 years old. I worked in the 100 Areas from [deleted], 1948 through [deleted]. All of that was with GE, except for about a year and a half with Douglas United Newspaper. For three months, I worked in the 300 areas in the Redox Training Lab, doing analyses on redox of the separation slurries. I don't remember much about that because it was back in 1969 or 1970. The rest of the time I was in Quantitative Engineering in the 100 Areas.

The thing that I keep remembering pretty well is riding buses to work in the 100 Areas through the nitrous oxide and the iodine-131 clouds. I didn't know what it was until the downwinders started from Spokane through Hanford, and they started filing suits for what they said all those places got from releases from the 200 Areas. We drove right through those released clouds. I know how they tasted. I wish I had known then what I know now. I would have kept a daily log. There was no monitoring for that. Iodine-131 has a short half-life. The next day you couldn't get any reading from it, so I don't know what I ingested.

The rest of the time, I worked in Project Engineering to plan improvement projects for the reactor buildings. Most of my time out there was spent in the 100 Areas – all of them.

I've had one cancer. That's all I need to say.

Sam Glover:

The Advisory Board on Radiation and Worker Health (ABRWH) has been reviewing the technical basis documents that we use to do dose reconstruction. One of the issues that came up is that the practices began to change in the 1950s. In the 100 Areas, they were running the reactors harder and the shielding may have begun to deteriorate, which may have caused higher exposures. The radiation protection programs of the time were using the NTA film badges that may not have picked up all of the dose. Because we use the neutron to photon ratio to calculate dose, we need to know about these changes that may have occurred. If you remember things along those lines – what changes may have occurred, the practices of the time – that would be very beneficial.

Response from Former Worker #3:

We didn't have the film badges or the dosimeter pencils on the bus trip out to the work areas and back when we went through the iodine-131 clouds. We picked those up at the badge house every morning. When we went into the reactor buildings, we went through another guard shack and picked up the dosimeter pencils. Those were used in conjunction with the film badges when we worked in the 105 Buildings.

Sam Glover:

You said earlier that you worked on process improvements for the reactors. Did you do the engineering?

Response from Former Worker #3:

Yes.

Sam Glover:

Do you remember what changed with time?

Response from Former Worker #3:

I know that one of the big improvements was changes to the cooling system. It improved



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production so they could leave the fuel in longer before it was discharged. We didn't see too much change in the radiation monitoring.

Sam Glover:

It was mentioned at the ABRWH meeting that they actually packed the shielding with thorium to help reduce exposure. Do you recall anything about modifications to the shielding?

Response from Former Worker #3:

No, I remember modifications to the control systems. In the original system, they put water into one of the main emergency shutdowns, or SCRAMS, to shut the reactors down in case of emergency. They stopped that practice and went to a Ball-3X system that consisted of boron balls that were dropped into the reactor if needed. Fortunately, when I was out there, the only time they did that was on a test basis. The control rods were horizontal rods, the vertical rods were safety rods, and the third system was what we called the Ball-3X system. I was out there in the 100 Areas during shutdowns and during operations. If we had a fuel element failure – what we called a ruptured slug – inside the reactor, three or four of us would go out there and take a look at the fuel elements with a fluoroscope after the balls were discharged into the bottom of the storage basins. There were a couple of times that I had to give up my personal clothing. I would go home in coveralls and booties and my wife would ask me what in the heck was going on.

Sam Glover:

Regarding the accidents and incidents, do you remember what monitoring was done when you went into the contaminated areas? Did you have people with you?

Response from Former Worker #3:

When we went into a danger zone, the radiation monitoring personnel went in with his various instrumentation – his CP (cutie pie) and so forth. As we started our work, he would tell us how long we could stay in there and then he would leave. We would get out after the prescribed amount of time. There were a lot of times that I had to wear a gas mask.

Sam Glover:

Do you mean an assault mask?

Response from Former Worker #3:

Yes.

Ed Scalsky:

Do you recall whether they made surveys on the front face at the reactor and how frequently they might have made them?

Response from Former Worker #3:

They didn't do the surveys during operations. During shutdowns, if there was work going on at the front face, there would be a monitor then. On the rear face, they had to take nozzles off during discharge operations. Before they discharged, all the personnel would leave, including the radiation monitor.

Ed Scalsky:

Did you ever have to get in behind to loosen up a stuck fuel element or anything like that? Were you ever involved in that?

Response from Former Worker #3:

I did at the 100-K Area. I don't remember the tube number, but they had to hammer a whole



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tubeful of elements out because it had expanded in the aluminum tube and was stuck in the graphite.

Ed Scalsky:

Do you recall what kind of exposure you received at that time?

Response from Former Worker #3:

I think it is on my records. I took quite a bit.

Ed Scalsky:

Did it stay within the limits?

Response from Former Worker #3:

There were a couple of times that I exceeded the limits a little bit. I was working in one of the inner rod rooms; I think it was in B Reactor. I don't remember the specific incident. I was told that I didn't leave fast enough so they told me I couldn't go back into the B Reactor for a couple of years. The manager at that time was [deleted].

Ed Scalsky:

Did they write special work permits for you when you did that kind of work?

Response from Former Worker #3:

Yes. The group I was in was called Pile Technology. All of our work in the reactor buildings was done on a SWP (special work permit).

Ed Scalsky:

How did they determine when you had to wear respirators?

Response from Former Worker #3:

It depended on what was going on. When they did a tube replacement, there was a chance that radioactive graphite would have been present.

Ed Scalsky:

Did they take air samples?

Response from Former Worker #3:

No, not while I was around.

Ed Scalsky:

So they determined that you should wear a respirator based on the job that you were going to do rather than on air samples that they might have taken?

Response from Former Worker #3:

Yes.

Sam Glover:

Do you remember if fission products were a problem in the uranium area in the early times, as far as getting contaminated or breathing them in?

Response from Former Worker #3:

No, but I worked in the Experimental Levels for several years where we were in with a group that was doing isotope production on the reactors. They called them the Experimentals. We irradiated cobalt for the first radiotherapy for cancer treatment.

Sam Glover:

I know that they were making cobalt-60.



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Fred Duncan:

Do you recall when you did that work?

Response from Former Worker #3:

It has half-life of 5.3 years.

Fred Duncan:

I am interested in the dates when you were doing the cobalt-60 work. Do you recall the years or the time period?

Response from Former Worker #3:

No. We put the cobalt in special fuel elements that had a hole in them. Then we sealed the hole with a lead gasket.

Fred Duncan:

Was that in the 1960s? Do you recall?

Response from Former Worker #3:

Yes, it was in the 1960s. I've talked enough. Do you want to talk?

Comment from Former Worker #4:

I don't think I could add anything. I'm [deleted]. I worked in 1944 and the only thing that I hated was going to and from work in that yellow stuff. I'm sorry I don't remember what I did. I got a certificate from the War Department that said I helped end World War II because I helped build the atomic bomb, so I know I was out there.

Sam Glover:

Do you remember which facility you worked in?

Response from Former Worker #4:

I worked at 2-West. I was a secretary, so I never wore a hardhat. I never wore a badge. I didn't work in any of those things. I started in 1944. As I said, I don't remember much.

Sam Glover:

How long did you work there?

Response from Former Worker #4:

I'm not really certain. But I had to have worked past 1946, because that's when I got my certificate. I've had cancer six times and open-heart surgery. I've had a stroke. I hated it out there. I was glad when they finally moved me back to town. I hated going out there through that stuff. It smelled and tasted terrible.

Comment from Former Worker #3:

We rode on separate buses.

Response from Former Worker #4:

You weren't even out there when I was there.

Response from Former Worker #3:

I know. I'm too young. I have always liked older women. We've been married for 58 years.

Mark Lewis:

Something that was said earlier helped this gentleman's memory. He would like to speak.

Comment from Former Worker #1:

He was talking about the ball system. Periodically, they dumped those balls to see if the system



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worked. Then we had to go down underneath to shovel them into a bucket and they were carried back up on top. We were overexposed if we spent three minutes in there. That was enough to get about three shovelfuls and then we had to get out of there.

Response from Former Worker #3:

That was not in the 300 Areas.

Response from Former Worker #1:

No. That was in the reactors. The reactor in the 300 Area would only produce five watts.

Response from Former Worker #3:

Yes. That was in the 305 Building.

Response from Former Worker #1):

Yes, that was the Test Reactor. But the other ones, I went out there on radiation burnout time. We would scoop up those boron balls and put them in a bucket to go back up. It got pretty hot.

Response from Former Worker #3:

Then you should have had respiratory equipment on your being.

Response from Former Worker #1:

We didn't wear respirators, but we did have pencil dosimeters and things. They told us when to get out of there. It was in the later years when I went out there on burnout.

Sam Glover:

Do you remember giving any urine samples when you did that work?

Response from Former Worker #1:

They took a urine sample down at the hospital on a monthly basis, but I never heard any results. I don't know if they have any record of it or not. I spent 40-some years out there with that uranium.

Comment from Former Worker #5:

I'm [deleted]. I came to Hanford in [deleted] 1944. I worked in the Gray Building in Pasco during the construction days. Around [deleted] 1944, I transferred into Operations. I was one of the Gatehouse Girls. We gave out the pencils. I spent a lot of time in the 300 Areas. I assembled the names of all the people who had off-scale readings for the Plant Manager for the monthly reports when I was in the 300 Areas for about a year. I just worked there in the 1940s. After that, my five sons were born. I quit working to raise my sons.

Sam Glover:

But you did assimilate lists of the off-reading dosimeters for people who were exposed?

Response from Former Worker #5:

Yes, I made the lists for readings that were off scale.

Comment from Former Worker #1 to Former Worker #5:

I signed up on [deleted], 1944.

Mark Lewis:

Does anyone have more to say?

Question – Sam Glover to Former Worker #3:

I have a question for this gentleman about the urinalysis program, the bioassay for lifetime. Do you remember the programs?



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Response from Former Worker #3:

Periodically, I would find a bottle for a urine sample on my front porch in the morning. I left the sample out there and I guess that they picked it up later in the day. I don't know how many times. I think it was because of my exposures out in the 100 Areas. But as the gentleman said, I don't know what the results were. Evidently, they sat out on a limb and waited until the next time.

Ed Scalsky:

Do you remember what year that was?

Response from Former Worker #3:

I don't remember the exact years. I worked in the 100 Areas from [deleted], 1948 through [deleted] 1968 when I went back to GE in San Jose. I lost my hearing because of the exposure to the high frequency motors and pumps. So, California and Illinois won the hearing case. Washington didn't. (His wife added that he worked in nuclear power in Spain twice in three years.)

Sam Glover:

We have a smaller group this evening, so it isn't taking as long to talk to all the workers as it did this afternoon. Does anyone have anything else to say?

Questions from a current Hanford Worker to Former Worker #3:

I just have a couple questions that I would like to ask you. My name is [deleted]. I'm a Steelworker and I am also a trustee for HAMTC (Hanford Atomic Metal Trades Council.) I've worked in the 100 Areas for almost 24 years. I was a reactor operator at 100 N from 1983 until [deleted].

When you talked about the boron carbide balls, do you remember when they used samarium prior to that?

Response from Former Worker #3:

No. But all of the old 100 Areas – B, C, E, H and F – had the Ball-3X systems.

Question [deleted]:

Do you remember if you went into the ball recovery rooms in fresh-air or assault masks?

Response from Former Worker #3:

We had a fluoroscope that we used for the visual examination of all the control rods and access areas on top of the reactors to look for any balls that might have lodged in the rods.

Question [deleted] :

Right, because the graphite had shifted and the balls would get hung up. Did you ever use samarium, or was it always the boron carbide balls?

Response from Former Worker #3:

We used assault masks for that, because when we drew the fluoroscope back out we had to decontaminate it. I don't know how many times we did that.

Mark Lewis:

Has everyone who worked out there during the 1940s had a chance to speak?

Comment from Former Worker #1:

A lot of people wonder what that ball system was for. I couldn't hear if he said so. The ball system was to control the reactor if we had an earth quake or if the reactor shifted enough that



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the control rods dropped in. You could dump those balls down in there and they would shut the reactor down.

Response from Former Worker #3:

Yes, but there didn't have to be an earthquake. It could be a loss of power that dropped the control rods in.

Response from Former Worker #1:

I was just using one example. The ball system was very important in the safety of the reactor. I'd pick up little pieces of information here and there as I was going along. That was a fascinating job to me. It was quite a challenge. I never turned down a job that they gave me, except when they wanted to make me a supervisor. I made more money than my supervisor by working overtime.

Mark Lewis:

We can really appreciate the work that you all did out there. As Tom Brokaw said, yours is the "Greatest Generation." There is no doubt in my mind that you are, and on behalf of my generation, I thank you sincerely.

Sam Glover:

At the beginning of the meeting, I mentioned that our colleagues from the DOL Resource Center are here. If you have a question about a Part B claim, or need help filing one, or if you have questions about the Part E for chemical exposures, they are here to help in any way that they can.

Teresa Hammer, Hanford DOL Resource Center:

I'm Teresa Hammer from the Hanford Resource Center. If you do have some questions about the new Part E, or the impairment or wage losses covered under Part E, let me know and I can help you with that. A lot of people have filed and don't understand that there is this new amendment to the law. I have some literature out in the hallway. I will be out there.

Mark Lewis:

Thank you. Does anyone from the general public have any comments or questions? We want to make sure that everyone has a chance to speak.

Comment from a current Hanford Worker [deleted]:

He was talking about the 305 Building. I toured the 305 Building in 1985. I was a reactor operator and they were making fuel for us. Nobody down there ever wore a respirator, not even in the 1980s.

Earlier, they were talking about their doses being rolled back. That was still being done in the 1980s. My dose was so high the last couple of years I was an operator that from September on, I didn't do anything to speak of. When my dose got up around 2700 or 3000 mrem for the year, they would roll back the last couple readings from what your pencil readings were, or what they got off the "superdads," or whatever else you were wearing when you went in to load the fuel or take care of fuel ruptures. The things that they were talking... A lot of that was still standard operating procedure in the 1980s. When they were talking about training, it was the same way. When I started working in the 1980s, I had grown up out here and I know the background in this work. The first day you would go into a zone, one of your coworkers who might have been hired two weeks or two months ahead of you showed you where to get dressed, what you were supposed to wear to go in. It was still that way in the 1980s.



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Sam Glover:

I want to make sure that I understand what you mean when you say “rolled back.”

Response from a current Hanford Worker [deleted]:

On your weekly sheet, when your annual accumulated dose started getting up toward 2700-2750 mrem, they would hand you a pencil dosimeter to wear all the time because they didn’t want you to get any dose. But when your next dosimetry reading came back, it would be lower as it got toward the end of the calendar year.

Sam Glover:

This is obviously retrospective. It doesn’t tell you what you get this week, so they were trying to make sure that you didn’t go over the reading.

Response from a current Hanford Worker [deleted]:

Yes, but the reading would always come back at a lesser amount at the end of the year.

Sam Glover:

Even though you were doing the same work?

Response from a current Hanford Worker [deleted]:

That’s correct. Or they would limit your work. As I said, the last couple of years that we operated the reactors, one year that happened in September and I believe the other was October. I didn’t do much until January to get my exposure back so I could start a new calendar year.

Sam Glover:

So you were on work restriction?

Response from a current Hanford Worker [deleted]:

Yes, essentially. Does anyone else have anything that they would like to add?

Comment from Former Worker #1:

When NIOSH calculated my radiation exposure, I had to have 50 percent to be compensated. They gave me 42.8 % without having much of a record of any kind for those first years. I didn’t think that the dose reconstruction was altogether fair.

Sam Glover:

We are looking at that, too. We want to make sure that we gave you the exposure correctly.

Comment from Former Worker #1:

I don’t know how they could have determined the radiation doses that we got the first few years when we had no monitoring system at all.

Sam Glover:

That is part of what the Advisory Board is asking us to determine, to make a fair evaluation of that time frame when there was no bioassay.

Comment from Former Worker #1:

Everything that I have read says that radiation can cause colon cancer but so can other things. I don’t know how they calculated my exposure, but I was sitting around in a building with 50 tons of uranium and that’s a radiation source. When I had that interview, I told them that I was around uranium. They asked, “How many ounces?” I said, “Tons, not ounces.” I didn’t think it was an altogether logical calculation. I don’t understand what they used. My exposure was higher than average because I did anything that I was asked to do in the line of work. I worked a lot of different places, even some of the dirtiest.



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Sam Glover:

We are taking all of this information into account as we prepare the SEC evaluation report and the technical basis documents. We will probably take the urinalysis program information from the 1948 timeframe and consider that the limits were higher in the very earliest timeframe and scale that up. I can't speak for your individual case. I don't know what they did for your dose reconstruction.

Comment from Former Worker #1:

We started out working six ten-hour days, so the time limit is a lot more than what maybe they calculated on.

Sam Glover:

When we make changes to the technical basis documents, we go back to see if there are any claims that could exceed the probability of causation of 50 percent and become compensable based on those changes. If changes to that technical basis document are from that timeframe for this uranium evaluation, then your claim could be re-evaluated to see if it changes the outcome of your dose reconstruction.

Comment from Former Worker #1:

The last communication I had with them, they doubted that I even worked around uranium.

Sam Glover:

It would certainly be wrong for NIOSH to make that assumption. That is something that we want to do better on.

Comment from Former Worker #1:

Maybe it was an individual opinion and not NIOSH's opinion.

Sam Glover:

There have been changes to the way things are done in the past few years. The program does try to make sure that claimants are evaluated fairly. In your case, if they didn't, I hope that we can correct that.

Comment from Former Worker #1:

At my age, I'll probably make it without it, but it would be nice.

Mark Lewis:

Certainly, what you have said today does not hurt your case in any way. This lady would like to speak.

Question from an identified attendee:

Have you learned anything today that will impact what you are doing?

Sam Glover:

This is Ed Scalsky. He is our technical basis document expert. I'll ask him to speak to that.

Ed Scalsky:

We will evaluate the information that we have gathered today to see if there are any changes that have to be made to the technical basis documents. We will do whatever is necessary.

Question from the attendee:

Did you know that there was so little monitoring and so little use of respirators and other protective equipment when they were working in the rods and the other parts of the reactors?



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Ed Scalsky:

We were aware that there was monitoring at different periods of time. We will have to re-evaluate the period of time that we discussed today.

Sam Glover:

Regarding the use of respirators, I would like to clarify something. We try to use bioassay data when possible. We don't take into account any protection factors that may be afforded by respirators and other safety equipment. It is important to explain what the mentality of the program was at the time and what controls may have been in place, but our primary method of dose reconstruction is to rely on bioassay data.

Question from the attendee:

Did you know that the workers had to ride through those clouds of chemicals to get to their work areas?

Ed Scalsky:

I had not heard about that before today.

Comment from the attendee:

I worked as a replacement secretary for just two summers and I remember that vividly. It tasted terrible. On my ride to N area in the summertime, I would sometimes go through two, maybe three clouds. This was in 1967 and 1968.

Ed Scalsky:

I haven't seen any references to it in any of the documents that I have reviewed. Nobody has brought to my attention that that particular situation existed.

Teresa Hammer:

I just wanted to add that the Department of Labor held a meeting about the changes in Part E with retirees here in 2004. It was the first time that I heard you speak to that yellow cloud. I know that it is in the DOL report. I don't know if you have access to that or if it is important, but it was reported at that time.

Sam Glover:

We can make sure that we are aware of it.

Comment from Former Worker #3:

There was a posting on the internet about the specific dates of the various releases in the 200 Areas. I have a printout of it somewhere at home.

Sam Glover:

The CDC (Centers for Disease Control and Prevention) did the offsite worker reconstruction, so I know that there is information regarding the offsite releases. We need to make sure that we have incorporated them.

I really appreciate that you took the time to meet with us here tonight. I'm sorry that there weren't more people here. We had a larger turnout this afternoon and we really didn't finish up until about 15 minutes before you all started showing up. We are going to follow up on some of the information from these meetings. Today we have identified some people who were certainly here in the very beginning: people who worked with the uranium ingots, a reactor engineer who remembers some of the design changes that happened from the very beginning. These people have really added to our knowledge base to do the best job that we can on our SEC evaluation



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report and our technical basis documents. I really appreciate that you came out and provided input. If you have any questions, I would be happy to give you my card. There is contact information in the handout. If you would like to add something one-on-one, we are going to stay after the meeting. If you would like to provide something to NIOSH in writing, then that would be greatly appreciated as well. Thank you all so much for coming tonight.

Dr. Glover adjourned the meeting at approximately 6:15 p.m.