GSI AFFIDAVIT TESTIMONY

July 7, 2006

SimmonsCooper, LLC
707 Berkshire Boulevard
East Alton Illinois 62024

Court Reporter

1

2 PARTICIPANTS

General Steel Industries Employees:

25

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2 IT IS STIPULATED AND AGREED by and between

3 SimmonsCooper, LLC and Pohlman Reporting Company that

4 the July 7, 2006 GSI Affidavit Testimony will be

5 transcribed to the best of their ability by a Court

6 Reporter.

7

8 O-O-O

9

10 .: Good morning, everybody. I'm

11 , and as you know

12 are here helping this morning. And the purpose of

13 their meeting today is to gather information from you

14 site experts on information that will help our special

15 exposure cohort effort to NIOSH. I just wanted to

16 mention that we're here at SimmonsCooper. It's July

17 the 7th, 2006. It's about ten o'clock in the morning.

18 And I really appreciate all of you all coming to be

with us this morning.

So the first thing I wanted to mention is that each of you should have a handout which has the basic topics that we're going to talk about this morning, the affidavit topics. You will notice in your handout that there are 30 topics. And -- and under each topic there are some names that and

filled in of people that they thought might have some information about each of these points.

Now, that doesn't mean that they're the only ones that can talk. So if you happen to know more about this information as said, please get up to the microphone and talk to us now or at the end of the session you can write -- and during the session you can write your thoughts down on the back of your handouts. And at the end of the session we'll have some additional handouts that if you want to sign up on a particular topic, then we will get in touch with you and record your further thoughts. So today is not

the last chance.

We are most pleased to have -- both our court reporters and the videographers here because we feel that this information that you'll talk about this morning is extremely important to get down accurately so that we can share it with NIOSH and with the Department of Labor.

So with that as -- that as a preamble I also want to mention that , is -- will be handing out or has handed out to you two pieces of paper. At the top it's called draft sample letter, and it's a letter template to send to the Paducah Resource Center to request copies of your claims records. In

particular what we're interested in you all doing if you feel this is a good idea -- and I -- I strongly recommend you do it -- is we've learned in Washington at the advisory board meeting on radiation worker health that you all have a right to all of your information about your radiation dose reconstruction.

And so we think it's very important that you all ask for that information, the complete set of documentation.

So anyway, you can -- you can read this letter. And in the areas that are in yellow, in highlight you just fill in you are own information. Now, you're perfectly -- and you know, I encourage you if you need to write other information, that's fine. But this basic letter will get the job done. And in particular I tried to cover all the kinds of information that you might want to obtain from them including your telephone interview transcript and in particular your claim status notification letters.

I know that many of you have had your claims in for several years. And it's very important that in your own records you have the information that NIOSH has fed back to you on the status your dose reconstruction. So I encourage you to think about submitting this letter. We'll be happy to help you if

you have problems on how to do it further.

The second page is simply the contact information for the Paducah Resource Center which is the place that has offered to get this information for you. So that's a -- an outreach station. Many of you all have already interacted with Paducah. It's run by the Department of Labor, and Katherine Fuller is the current office manager. And I gave you their phone numbers, their fax numbers, you know, toll free telephone numbers. So if you need to talk to them, that's also -- might be helpful. But I think it's important to send this letter as your official request for your own records.

Now, the -- the other thing I want to do before we actually start the real presentation I would like to read into the record two incidents that ' wrote up and shared with me. And I'm doing this for several purposes. One, I want to get this into the official record because I think these things are important. But also for you, for the workers I think I want to give you a flavor of the kind of detail that we're interested in capturing today on videotape and on audio and in our transcripts.

24 So has helped a lot on writing up

25 for example the Magnaflux procedures and with

1 providing names of people and many things, but this is

2 just an example. I'm not sure where these fit into a

3 particular affidavit topic, but I think it will be

4 interesting to you all to hear the level of -- of --

5 of detail that we're trying to capture this morning.

6 Item number 1, it says I was present as a

7 betatron operator when isotope operators used shooting

8 rooms with cobalt 60, 60 to -- cobalt 60, an 80 curie

9 source for applications. I assisted these operators

10 in setup and made sure the betatron was inactive. The

11 betatron aiming limits were supposed to not include

12 the directions of the control rooms or the exit

13 railroad door. I was later informed by the cobalt

14 operator of contamination being picked up by the

15 Geiger counter in the control room as the isotope was

16 being used. And he has in parenthesis possibly

17 radiation from the isotope was going over the top of

the concrete walls of the shooting room on to us in the control rooms.

The second item that reports is there was an incident where a pallet of new x-ray film was left just inside the railroad exit door. When the pallet of new x-ray film was discovered after shooting was completed after examination of the film saw that the film was exposed around the outer

edges. This incident proved that radiation was exiting down the long leg of the shooting room and through the metal railroad exit door into Building Number 10.

So I think you can understand from those two excerpts this is information that certainly will not be in any of the cleanup reports from the Department of Energy, probably won't be in any of the company records. They are things that you and only you guys know, and we need to get them recorded because they directly affect how much radiation dose

you exposed, where you got it, and where -- where in the betatron building for example.

So with that as a -- as a preamble let me please ask that we go around the room. And I'm going to ask each person as we do so to give your name and actually to please spell your last name. And please be considerate of our court reporter. We have to speak slowly and clearly. And I am assured that you will hear from her if -- if -- if she can't understand. But we need to get this down. So maybe we could just start around the room.

: Okay. My name is

. And --

: , maybe you could talk

about -- just the other information maybe that everybody could give is the years that you worked at General Steel Industries and -- and what your basic job was. I know you all did many things, but just those two things.

: My basic job was radiography and ultrasonics. And I became employed in -- November of 1962 was my first application, and I stayed there until . And I done radiography work with the cobalt 60 both 80 curie and the 100 curies that they got from other companies.

: Okay.

And also we used a 150 curie iridium source that they brought in for pipe flanges. And then of course the main job was with the betatrons.

: Okay.

: The -- both, 24 MEV and 25 MEV in the old betatron and new betatron.

: Okay. Thank you. We'll -- we'll go back and get more information about those as -- as the day progresses. So

:

I worked in the foundries of the Number 1 Building, Number 2 Building, and Number 12 Building

for -- and I went to work there in March of 1953 until

And I worked all over the foundry.

: My name is I basically worked in Magnaflux, layout, ultrasonics, and mostly radiographer. I worked in both betatrons, 8, 9, and 10 Building and 6 Building. The major portion of my work was x-ray and layout, marking up defects, follow up on repairs in Magnaflux and ultrasonics.

: Okay. Thank you.

My name is I worked at General Steel from November of 1963 to in the betatron Magnaflux department. I operated in the new betatron and the old betatron operating and as a crew member in both betatron buildings. I also worked as an isotope assistant at times. I also worked as a Magnaflux operator in 8, 9 and 10 Building. I also worked with on occasion at American Steel Castings in Granite City as an assistant to who was

22 operating a -- an x-ray machine there. Thank you.

23 : My name is

24 I was a lead switchman at the General

25 Steel Castings from 1953 to And I was in and

1 out of the betatron building, all -- all the buildings

2 in the whole plant. We transferred castings from

3 betatron into 9, 10 and 8 Building from the betatron

4 building.

5 . My name is

6

7 I worked at General Steel Castings from 1951 to

8 I was a timekeeper and worked basically in 10 Building

9 but made trips sometimes to the betatron to determine

10 the location of castings. My job was to keep the time

11 records of people who worked there and what they did

12 and -- and what their function was and what -- on what

13 castings they worked on. And basically I guess that's

14 as much as I can say. I -- I can honestly say that I

15 never saw anybody wearing any kind of a badge.

My name is . I started to work at General Steel in 1955 until I was in the maintenance department, oiler, and pipe fitter. And there's no place in that plant that I haven't been including tunnels, ladders, roof, everywhere.

: My name's I worked in General Steel from spring of '63 to I was a x-ray technician, Magnaflux operator, anything to do with the

nondestructive testing department that's what I worked with.

COURT REPORTER: Nondestructive?

Nondestructive testing.

: My name is I worked at General Steel from -- let's see. I think it was September of 1963 to I was -- my basic job was mostly x-ray and ultrasonics. And I operated the -- both the

24 and 25 MEV betatrons old and new. I operated the -- I used the cobalt pills, uranium pills. And I also used the leased x-ray machine from American Steel that the company leased from American Steel so we could shoot thinner metal.

could you please introduce yourself and then basically share with us what you did at General Steel Industries and the time frame you worked.

My name's I was a foreman, film interpreter in the betatron, in the Magnaflux area in the years of 1963 to 1967.

for the court reporter could you spell your last name please.

Thank you.

Okay. My name's

COURT REPORTER: You got to speak up for me, okay?

And I worked in the betatron -- both betatrons, the Magnaflux. I was a film reader and foreman in the betatron.

COURT REPORTER: Film reader and what else did you say? I'm sorry.

: Film reader in the betatron.

COURT REPORTER: You have to keep your voice up.

: I was foreman.

COURT REPORTER: Pardon me?

I: I was foreman.

: Is that it,

: Yes, sir.

Okay. So why don't we get started then with our -- little lag here. So what I'm going to do is go through each of the -- let's -- here we go. Let's do it this way. Okay, good. Okay. So the first -- the first affidavit topic that I'd like you all to address is as follows: We're -- we're

interested in hearing from any workers who can identify known Mallinckrodt uranium ingots being at General Steel Industries.

And when we say ingots we're also interested we -- and believe that at General Steel Mallinckrodt sent over what were called betatron slices, ingots, slabs, and billets. And we're interested in knowing where those various types of uranium metal, where they were stored, how they were shipped both to and from General Steel, and what was their movement in the plant. And so we've identified as possible people who know about those things. And I'm going to let -- on each of these I'm going to let just hand the microphone to whoever he thinks is appropriate to start out with, and then we can take it from there.

I need to mention for the -- for the record the reason that the uranium is so important is because officially that's the reason that you all

would get compensated under the Energy Employees Illness -- Occupational Illness and Program Act, EEOICPA. And so the official record says that that was used at General Steel from 1953 to 1966.

: Could we start with

please.

: Well, my partner and I,

-- they sent some slices with a waxy coating on it for us to x-ray on the midnight shift. It came in on -- they came in on flatcars like everything else did that came into the old betatron. And a couple of nights later they sent looks like some small ingots, and we had to use like three different films to shoot this because of the exposure, the thinner and the thicker levels, the variation of the thickness. And we divided it up into the four shots, the slices. We backed it up with lead, pointed the betatron straight down, and made four shots each. Now, we didn't know -- really know what it was. But

now that you mentioned it I kind of suspect that that's what it was.

, may I ask you were there any markings? I know you all dealt with a lot of different kinds of ingots and metals and so forth. But were there any special markings on there that indicated it was Mallinckrodt or --

They didn't have any kind of special markings on it.

Did they have any markings, and writing at all?

No writing at all.

: Okay.

But we had to identify the date and the shift and so forth, put our ID on it.

. Second question is would you -- could you put a time frame on when you worked with those ingots.

I started in '63. So it was

9 like probably I would say about '65.

10 : Okay.

11 : Probably.

12 : That's when it started?

13 : Right. That's when we would

14 have --

15 : All right. Okay. Good

16 enough. Let me ask you this. The -- there's always

17 been some question about whether the -- the x-ray --

18 the x-rays even from the betatrons would actually

19 penetrate uranium. Did you all have problems getting

20 a good picture?

21 : The picture was not very

22 good.

23 : Okay.

24 But it took longer than --

25 Right.

1 : -- a normal -- than a normal

2 piece of metal that you were shooting. It took a lot

longer to shoot.

: How long would you say one of -- you said there were four exposures. How long would you say each exposure was?

: It took us probably about a couple hours.

A couple hours?

A couple hours for each exposure.

: Okay. All right. Thank you. who's next?

, could you -- I know you and worked together quite a bit. Could you share your experiences?

My name is I worked as an assistance crewman with on numerous occasions. He was a very fine operator in my opinion. I worked under his direction on ingots -- the ingots, slices. I verify they were there. At that time none of us knew exactly what they were. We weren't told -- we were told absolutely to ask no questions, it was a -- of a classified nature. We

later saw pictures of these things and identified

these ingots -- the ingots and slices through pictures. We saw these pieces throughout -- throughout various locations in the plant at times. I know I saw some in 6 Building on occasion possibly stored down there. I don't know. But I saw them there. But I worked there from 1963 to I cannot specify how many times we shot these particular pieces. But they were there, and we worked on them. Thank you.

:

:

: Could you share your thoughts on same ingot situation?

: Yes. I remember the uranium billets. We'd -- another operator and myself would be called -- be scheduled for Sunday work which was double time. And we had families, of course, and we were never told what the product was. Having the

knowledge of a lab technician for the previous ten years I suspected it was something out of the ordinary because they did not look anywhere near the appearance of steel and other metals we were accustomed to deal with. So all I can say is that yes, we did. There were several Sundays we picked up doing this in the -- from -- in the period of 1964 to about 1972.

, would you go into it for us a little bit more? You said the metal did not look like steel and your other alloys.

: Of course.

: Describe for us a little more why it was different.

: It -- it was a little darker.

: Okay.

: I would have thought it was more dense.

: Uh-huh.

: And it took a whole lot more

radiation.

: Right.

. Yeah. And but --

: What -- what's your recollection of the time of an exposure for let's say a uranium ingot for instance?

: I don't recall --

: Okay.

: -- any more.

. That's fine.

: However I did notice that one time -- one Sunday we for several hours did not use film, we were just shooting them. And we -- we

laughed about it because people says we were charging them. And of course that was a joke, you know.

: But you're sure there was no film used?

That's right in that case for about two or three hours --

: All right.

-- on certain ones like if they were something special and --

: Did that word charging -- did that have any special meaning to you?

: Not really.

: You had been doing it a long time. Does that seem like an odd thing to say?

: Yes. But you don't question, you know.

: Okay.

After all, they got high class metallurgists over you --

Okay. Right.

-- why should we question it.

No. I'm not -- no, I'm not trying to second guess you. I'm just trying to understand what happened.

Uh-huh.

: So are any of the people that -- I guess I'd also like to know for instance in that particular instant you mentioned is there anybody here that could talk to us about that? I mean, do you remember who brought them there or --

I think they were first brought to the plant by a truck.

Okay.

Trailer tractor truck.

All right.

And then they were moved in on the railroad car --

All right. Okay.

-- out of the Number 10 Building. And -- and we usually left before they were reloaded.

Uh-huh. The word charged -- was the word activation ever used?

No.

Okay.

Not that I remember.

: That's fine.

It's been years ago.

24 .: That's fine. Well, that's

25 very helpful. Thanks. Thanks a lot.

1 , when you said

2 that was moved out of 10 Building would the work have

3 been done -- which betatron building, new or old?

4 The new building. Sure.

5 Okay. Thank you.

6 · Okay. My machine keeps on

7 going to sleep here. It'll wake up. Is there anybody

8 else who has anything that they would like to comment

9 about Affidavit No. 1 topic and the uranium ingots?

10 Okay. Shall we move on.

11

12 Yes, This is

13 now that's talking.

14 The only thing I remember

15 about those -- and these guys can correct me if I'm

16 wrong. Most of that shooting was done on the weekends

17 and nights. Is that not correct?

18 : Yeah. On the weekends and
19 mostly on the midnight shift.
20 : Yeah. Because I don't
21 remember anything about those other than the fact that
22 on the schedule they were classified I think as
23 Mallinckrodt ingots. And that was about the only
24 thing that we knew about them. And they were done
25 mostly on weekends because I didn't really --

1 : Yeah. Well, you were the
2 supervisor.
3 -- see that much.
4 You got a chance to see
5 that. The only thing they told us was to shoot them,
6 you know.
7 COURT REPORTER: I'm sorry, sir. I didn't
8 hear the end.
9 , could you
10 repeat --
11 He was the supervisor. He

got an opportunity to see the paperwork. But the only thing they told us was to shoot them.

And -- and also one other question that seems to stick in the back of my mind were they shot in an oblique manner, kind of not head-on but across the angle, or am I dreaming that?

We kind of shot them kind of head-on. But we had three different films, and I think we used double A, M, and C film. We tried to catch the different exposures.

Well, the M film would be the --

Right.

-- the slower film it

seems to me.

It would be the slower film.

Right.

And they -- they kind of blew off to the side. Am I correct?

Right.

And I don't think they were shot exactly head-on, but that -- that's 40 years ago. I can't remember.

: Yeah. A long time. But the plates we shot straight down.

Right.

, I think you -- in a previous time we talked you mentioned that actually you had looked at or you read the films from that.

That's right.

Do you remember anything more that you could share with us today about what the film actually looked like? I mean, ostensibly they were looking for fractures, voids, you know, poor casting of those ingots. Can you just tell us a little bit about that and also about you mentioned in the past I think that you filled out some kind of a checklist report that was sent with the films back to

Mallinckrodt.

The checklist report would have been the shot record I think.

Okay.

The listing, the number of the shot, and -- and the amount of roentgens that were -- that they were shot with.

Okay.

The film and -- and those shot records were packaged in the -- in a package and sent along back with the ingot. I don't think we -- I don't think we really read those films. I think all we did was shoot them and send them back to Mallinckrodt.

Okay.

Probably looked at them to see if they were okay or not blown out. But -- but as far as reading them for defects and sand inclusions, and gas blows, and things like that you would normally see on a casting, I don't think there were any of that because to my knowledge those ingots

22 weren't cast. They were -- they were poured from a --

23 a powder --

24 . Okay.

25 : -- I believe. It was --

1 it was a different ball game all together.

2 : Let me ask the whole group

3 one last question, and that is I'm still trying to get

4 at identification. So I understand that there may

5 have been paperwork saying that they were ingots from

6 Mallinckrodt. But there must have been some kind of

7 identifying mark on those ingots that -- that -- so

8 that you could match a particular film and a

9 particular report with a particular ingot. Do you --

10 do you all remember seeing any kind of -- you know,

11 anything that was engraved or stamped?

12 ': There was on -- it was kind

13 of a -- I don't know if it was stamped or not. I

14 don't know if it was stamped, but it was kind of a --

15 like you said kind of an engraving on some of them.

: Okay.

: That's the only ID, you know.

: But I mean, did somebody write that down.

: We wrote it down on the shot sheet.

: Okay. On the shot sheet?

: Right.

All right. That -- that

sounds good. has a comment I think, This is very good by the way. This is exactly what I'm hoping to hear this morning. I -- it's really good.

: My name is and I was on the furnace floor when there was some ingots brought in on a railroad car. And they unloaded them with a forklift and sat them on the furnace floor. And they was round, probably eight

inches round and I would say about three foot long. And they were stacked on a pallet. And they had a stamp, a red tag on the end of them, but I can't remember what the tag said. And they had some writing stamped on them, but I don't know what it was. They were setting on the furnace floor.

: What called your attention to that particular pallet?

, I just happened to walk by them and see them. They had a red sticker on the end of them, and that's more or less what I just noticed.

: So it was something different than the --

: Yeah. It wasn't --

: -- what you normally saw?

: Yeah, it was different from

scrap steel, what the normal --

: Okay.

: -- that's sitting on the

furnace floor.

: Thank you.

: I want to ask another question because he worked with those things. I'm not putting you on the spot.

: Oh, good.

: When you shot them did you identify the shot? Did you stamp the ingot with the Xs -- normal Xs and then the shot number?

: We put the Xs on each corner.

: With the lead?

: Right.

: And did you stamp the ingot like we did on all the rest?

: No. No. We did not stamp them. There was -- I can't remember everything, but I think there was -- there was some type of identification that we wrote from that ingot onto the shot sheet --

: Okay. So --

: -- to identify and to match

up with the film.

: The film matched up with the --

': Right.

.: -- what was existing on the ingot and we didn't stamp them?

': No. We didn't stamp them.

:: Okay.

': They already had that ID on them or --

:: Thank you.

': -- whatever, etching like you.

':

.: Question is when you put the markings on the ingots did you put a mark on there with yellow paint or chalk?

': Well, we marked it -- we marked it with that -- that paint that we had.

:: Okay.

: So there was an existing mark on there when the ingot went back?

: No. We laid it out.

: I mean, there wasn't a mark on there when the ingot was shipped back?

Oh, no. No. No.

: You didn't put the -- the -- the yellow paint on it?

: No. No. The paint wasn't there. We removed the paint.

: Okay.

: That was just for our own information for shooting purposes.

: Okay.

: Are you able to hear okay?

COURT REPORTER: Yes, sir.

: All right. Very good. All right. I'm going to -- Affidavit Topic No. 2, I'm

going to read it for the record, but I think we've covered that already. So I -- I just want to get if on the record that Affidavit Topic 2 is about workers who could testify that the Mallinckrodt Chemical Works uranium ingots were x-rayed in the GSI betatron buildings. I think we've talked about most of it was done in the -- in the new building. I guess that is one thing I would like to hear a comment about. Were they x-rayed in both buildings or just the new building.

: They were x-rayed in both

building,

: Okay. --

says both buildings.

: They were x-rayed in both buildings, both the new betatron, the 25 MEV and the old building the 24 MEV betatron. They were used and x-rayed at both buildings.

: And --

: As -- as testified

mostly on night shifts or weekends.

: Okay. , is that

-- is that your recollection too?

Yes.

: Both buildings.

: It was-- the only time that

I ever did it was on -- on the midnight shift or

weekends.

: How about the buildings

though? Did you operate --

: The old betatron -- I

operated back and forth.

: Okay.

: But mostly mine was shot in

the old betatron.

: Okay.

: And the other guys were

shooting stuff in the new betatron.

: That's great. So -- so and I think that's pretty well answered. And then I think we heard details about how the film was attached and -- and who saw them and the transport in and out and back to Mallinckrodt. So again, we can revisit this, but let's move on to another topic.

Affidavit Topic No. 3, General Steel workers who can testify that film badge dosimeters were worn and in particular that they were from the Landauer Corporation. That's L-A-N-D-A-U-E-R and/or from the Atomic Energy Commission. And we have one date -- set of data sheets from who -- where at the top of the sheets it's marked Atomic Energy Commission. And at the bottom of one of those sheets the people who apparently did the film badge readings was a group called the Nuclear Consulting Corporation. And interestingly I have looked that up, and it turns out that Nuclear Consulting Corp was absorbed is what the excerpt said by Mallinckrodt itself which I find an interesting thing. So I'm wondering, you know, the -- whether your claim is awarded, whether the special exposure cohort is

25 granted is entirely dependent, completely dependent on

1 whether NIOSH has sufficient radiation monitoring data
2 for you men. So it's of extraordinary interest to us
3 to find out where those badges were actually read and
4 where that radiation monitoring data may be today and
5 can it be -- can we get access to it, can NIOSH get
6 access to it. And so I would like to invite anybody
7 who could speak, and as I say
8 ; vho can't be with us
9 today, s here, and also couldn't
10 be here today. But if anybody can address that topic
11 of the badges and where they went and -- and who they
12 were from, that would be extraordinarily useful.
13 : You know, while we're
14 thinking that over too I'm also going to ask are there
15 any workers here today that were in either the new,
16 old 10 Building areas where you expressed there may
17 have been the radiation from the uranium who were not
18 issued badges? Was there anyone that would like to

19 comment to that? In your job were you ever in these

20 buildings without any radiation badges?

21 : Well , if it -- let me

22 combine both those questions.

23 : Okay.

24 : So among the people who are

25 here if you had a badge can you raise your hand. All

1 right. And so let's see. Everybody except

2 ?

3 : Me. I didn't have no badge.

4 : You did not have a badge.

5 : No. No badge.

6 : Okay.

7 : I didn't --

8 I : Okay,

9 : And I did not.

10 : And did not have

11 a badge.

12 : And I didn't.

13 : And did not

14 have a badge.

15 : And you definitely were in

16 those buildings?

17 : Sir, I think it's safe to say

18 the only people that had radiation badges were

19 employees of the nondestructive testing department.

20 The betatron department, Mag, layout, and sonics, we

21 were the only people. If we were -- our duties took

22 us to those buildings, we wore badges.

23 : Okay. So that's

24 talking.

25 : : you're another

1 individual had no badge?

2 : No badge.

3 : Okay.

4 : Okay. Now, how about -- so

5 where -- where do we want to start about where the

6 badges -- who -- you know, who analyzed them? What

badges were they, who were they from?

, any comments on the badges?

: Yes. We were issued them weekly. And at the end of the -- on Monday morning they'd be collected by and they would then be mailed off to the front office. Front office would send them to we thought Landauer and the other if there was another firm that would -- many firms could do it. And you kind of wonder whatever happened after that. We weren't -- yeah -- notified. So --

: I might add to that. They had two --

: yes, sir.

: They had two films in each badge. One was a weekly reading, and the other one was monthly. They changed one every week, and then they change the -- the second one every month.

: Can I just -- , I didn't

understand. I heard you say there were two films.

: Right.

: One weekly, one --

: One for a weekly reading and one for the monthly reading.

: Okay.

: They changed one every week and then the other one they changed it every month.

: Okay. So somebody came and collected your badge --

: Right.

: -- then made that switch? Obviously they took out the weekly one and put in a new weekly one --

: Right.

: -- and then gave it back to you.

: Right.

: Okay. Did you -- did you personally ever see any of your own personal readings.

: No. We never saw any readings.

: All right. Well, let -- let

me stimulate the group by saying this that we -- we --
we know now for sure, we saw them. We have the

records from And had his own
personal radiation monitoring records. And I'm trying
to think of the years we had them, but it -- I think
it was 1963 and '4. Well, at least the year '60 --
'62, '3, and '4 I think. And they were written out,
and it looked like it was a yearly summary of your
personal cumulative radiation exposure record for
those three years. And then he had some additional
sheets for later years '66 through '69 which did not
have any accrued radiation. So we're -- we're
wondering if there was anybody else who ever got such
a report back. I think , who can't be here
this morning said he had also seen some records like
that. But any of the betatron people or anybody that
had badges, did you ever get a record like that?
: No, sir. No, sir. Not to my
recollection during the period of time I worked there

did I have ever see a report on any of our film badge records, blood tests, anything.

: Okay.

: No, sir.

: So this would be

How about you. ? :

: Let me qualify this by saying that prior to becoming a foreman and a film

reader I was a -- a in the betatron. And as such I had duties of collecting the records and seeing that they got to their proper place. And to my recollection I picked up the film badges on a Monday, reissued the new film badges. I think we had a rack in the hallway that they were put in, and people picked them up on their way in. And I don't think they returned them to the rack every day. I believe they kept them in their lunchbox or whatever.

: They were returned -- they were returned after their shift. They had to be

12 returned to their shift. Yeah. They were returned to
13 the rack.
14 : The badges were then
15 collected and put in an envelope and sent to the -- to
16 the lab. What happened to them after that I don't
17 know. But I think in my capacity if there would have
18 been any -- any kind of confusion or overexposure, I
19 probably would have gotten that report. I never saw a
20 report on a film badge --
21 : Okay.
22 : -- the time that I was
23 there.
24 : That's important. That's
25 very important.

1 : I never saw anything come
2 back. And people -- on occasion we'd be sitting there
3 talking about them and they said they felt like well,
4 if no report came back, then everything was fine,
5 there was no exposure.

: That may be. But -- but you never saw any reports?

: I never saw a report.

Okay. , how about you? Any -- any comment about that.

: The - I don't know if I spelled my name before or not, but it's . The -- on the -- on the film badges there are pictures that were taken while we were operating on different castings where the -- you can see the film badges when we had them on our shirts.

: Right. We have pictures of that.

: So there is -- there's no doubt that they weren't used or worn and so on. And it would be very interesting to me to see those reports.

: Okay. We're trying to get a lot more reports. But -- but at least we -- we know that some existed for one man at least.

: The film badges actually were -- were required to be worn whenever you were in any shooting room.

: Uh-huh.

: So there should be -- there should be some reports somewhere someplace.

: I think you're correct. We're trying to find them very hard. Anybody else who would want to comment on Affidavit Topic No. 4 and the -- the other -- well, let me -- this is really related to Affidavit No. 3. So let me just introduce No. 4 which is a continuation. We have heard that there were some other monitoring devices used other than film badges. In particular some people have mentioned a survey meter by MacBeth, pocket dosimeters. I think mentioned having one of those. We know that there were some Geiger counters used. So does anybody else want to comment about those other types of radiation monitoring devices other than film badges?

: Sir, I on occasion

22 used a pocket dosimeter in -- in both betatrons. I
23 remember distinctly one day I was wearing a pocket
24 dosimeter at the old betatron. At the start of that
25 shift I zeroed and charged that pocket dosimeter --

1 zeroed and charged it, and at the end of the shift
2 recorded a ten roentgen -- a ten roentgen exposure on
3 the pocket dosimeter and logged it in a dosimeter log
4 book in the old betatron. The next day I was told
5 that -- after reporting it that they dismissed it as
6 zeroing -- improper zeroing of the pocket dosimeter.
7 And we all very well knew -- know how to zero a
8 dosimeter. Thank you, sir.
9 .: Well, go ahead. Let me
10 follow -- keep the microphone and let me -- let me
11 follow up on that. One of the things that would be
12 helpful at this point is number one, who would you
13 report to and who would give you the advice that that
14 wasn't -- that it was an erroneous reading? Do you
15 remember?

: I remember --

: I'm not talking about particular individuals but just what section of the -- of the plant would do that?

: We were told if we had an exposure with a pocket dosimeter to log it immediately on the log and report it to -- at the end of the shift to our -- our shift foreman, sir.

: But who -- who told you that, the shift foreman?

: Yeah.

: Okay.

: The next day -- the next day the shift foreman -- now, I don't specifically remember who that person was. That's been 40 years.

: No. That's fine. I just want to know.

: But he simply told me that it was dismissed as improper zeroing of the dosimeter,

sir.

: Okay.

: I sincerely questioned that, but what more could I do?

: Now, were there other people in the betatron building that had those pocket dosimeters?

: Yes, sir. On occasion they were used. used them. I know used them, probably anybody that ever did any kind of operating at either betatron would -- would use them on occasion in needed. They were an instant reference.

: Well, modern -- the modern recommendation is that you should have a film badge and some kind of an -- a realtime rate meter that would --

: -- indicate an accumulating

dose right now.

: -- on all -- on all occasions

we had the film badge.

: Right.

: On some occasions -- on some

occasions we picked up a dosimeter and used a

dosimeter varying on what type of work we were doing.

: Okay. So I want you to

expand on that. Did -- do you remember was it a

particular type of casting, a particular long

exposure, or what -- what would trigger that --

: I think --

: -- for you to be given a

dosimeter?

: I think if we -- specifically

if we assisted an isotope operator using isotopes in a

betatron we would want to grab a dosimeter along with

our film badge.

: Good. So we --

: Charge it and use it, sir.

: So now we're talking about a

gamma source, the cobalt source -- the cobalt sources

1 in particular, right?

2 : If we had anything --

3 : Or the iridium source maybe

4 or not?

5 : Both, sir.

6 : Both.

7 : Well, any type of isotope. If

8 we --

9 : That -- that would make

10 sense.

11 : Yeah.

12 : Okay.

13 : We would specifically use a

14 dosimeter.

15 : A high energy gamma source.

16 : On normal use or firing of the

17 betatrons we normally just used our film badge.

18 : That's fine. Okay.

19 : But any time we used the

20 isotopes --

21 .: That makes sense. Can

22 anybody else --

23 : Yeah. We had to do that

24 because we had to make sure that that --

25 .: I

1 : -- that that pill was reeled

2 back into the holder. They had it in a steel -- a

3 steel holder that you had to crank the pill out.

4 : We had more than that. Yeah.

5 : And a lot of times --

6 : Let's make sure the court

7 reporter's hearing --

8 : A lot of times it was reeled

9 out and it was left out, you forget to reel it back in

10 into the enclosure. And you had to have that

11 dosimeter go out and once you got high readings

12 huh-uh, I forgot to -- to reel it back in.

13 .: So just so that I understand

14 now, you're talking about a cobalt source --

15 : Right.

16 : -- with a little window on

17 the front and a crank and --

18 : Kind of like a -- a plumb

19 bob, a little --

20 : Some -- some kind of a --

21 yeah --

22 : Right. It ran out.

23 : -- that would open that

24 window and expose the radiation?

25 : Right.

1 : Open the radiation window?

2 : Right.

3 : Okay.

4 : And a lot of times it was

5 left open so you needed that dosimeter to go out

6 there.

7 : Yeah.

8 . And once you got that high

reading you said oops, I forgot to reel it back in, you know.

: So okay. Maybe you ought to talk about that a little bit farther. Why -- why would you be -- you -- the source was out there being used. You were in the control room?

: Right.

: Why would you go out there when the window was open at all?

: Well, that could easily happen.

: Tell me about that.

: You -- a lot of times the shots were quite long.

: Yes.

: And if you didn't have that -- a lot of times it might have gotten stuck --

: Yes. Uh-huh.

: -- halfway, you know.

3 .: Right.

4 : But I don't think anybody

5 ever went out there with it. But just in case it got

6 stuck in the -- in the tube you would --

7 .: And we had heard that there

8 were -- there were --

9 : There was malfunctions.

10 : But were there not incidences

11 where the window -- where the crank would get stuck?

12 : I can remember one case

13 where the crank did get stuck.

14 : We'll talk about those a

15 little bit later.

16 : Right.

17 .: But -- but there was really

18 no other way to close it, right? I mean, somebody had

19 to go and do it manually.

20 : Well, they did it -- they'd

21 jiggle the --

22 .: Okay.

23 : -- the control thing.

24 : And some times that would do

25 it.

: That would do it.

: And then you'd stay back?

: Right.

: Okay.

: , was there no safety device or anything on that container for the cobalt like there were --

: No. The only -- the holder, the -- the little holder that it'd reel back into.

: Okay. So that was all manual?

: Right.

: There was no automatic --

: No.

: -- door closer or whatever?

: No. Like -- it was not like the -- when you were using the betatron if you accidentally opened the door to go out there, the

19 betatron would shut down automatically.

20 : Okay.

21 : But that pill -- if you were

22 using one of those pills, if would shut down. You had

23 to bring that in manually.

24 : Okay.

25 : May I ask you a follow-up

1 question on the betatron. That -- that's interesting.

2 I -- I really didn't know that fact. How often would

3 you say the betatron would shut down in the middle of

4 a -- was that extremely rare, every day, every week,

5 every month?

6 : Depended upon what you

7 shooting. If you were shooting extremely thick metal

8 --

9 : Right.

10 : -- especially the old

11 betatron, it would shut down and you had to go out and

12 trip it.

13 : And why would it shut --

14 : Cool it down.

15 : Why -- oh.

16 : It was overheating.

17 : It was overheating?

18 : Right.

19 : Okay.

20 : The betatron unit itself?

21 : Yeah. It would overheat.

22 : Okay. M... ; you had a

23 comment.

24 : The -- the comment on -- on

25 the cobalt unit -- the comment on the cobalt unit,

1 when you cranked it back in to make sure it -- the

2 pill was back in the case there was a key lock.

3 : Right.

4 : If it wasn't in, the key

5 wouldn't lock.

6 : Right.

: Okay.

: So that was the only -- only sure way that you was sure that the pill was back into the case --

: Right.

: -- is be able to --

: Because if that cable was still out there --

: You couldn't --

: -- it wouldn't lock all the way down, it wouldn't close that door all the way down. It was just --

: So there was a key lock.

: How often would you say -- let's just say percentages of times you'd crank the pill back in, you thought it was all in, but -- but you wouldn't be able to actually turn the key?

: Well, I -- I was only --

: I mean, was that a rare thing

or --

: Evidently it -- it was -- it was rather rare.

: Okay.

: But I was only an assistant --

: Okay.

: -- in the shooting of whatever cobalt operators. When they were shooting the cobalt unit I was only as an assistant.

: Okay.

: I -- I was not authorized to use the cobalt.

: Okay.

: But that -- the one gentleman I did work with would not lock the case after a shot.

: Okay.

: And I finally called him down on it because of I -- I knew what the danger was.

: Sure.

: And it was sheer stupidity not to lock the case after a shot --

: Sounds like it. Yes.

: -- as a safety practice.

24 : Just common sense.

25 : Yes.

1 : Yeah. Okay.

2 ; that locking was

3 manual?

4 : Yes. It was a manual lock.

5 : Okay.

6 : Yeah. You had to lock that

7 case because if you're out there working, somebody

8 could come by and just -- just toying around and crank

9 that pill out on you.

10 : That's very correct. That was

11 the only safety device on that unit was the key. You

12 locked it back in and pulled the key out.

13 : That had to be done

14 manually?

15 : By the -- by the operator.

16 : That's very important.

17 Thank you.

: Okay. Let's see -- let's go -- now you've gotten through most -- a lot of hard things. Now we're going to give you some easy ones. Affidavit No. 5, General Steel workers who can testify that between the betatron x-ray sessions there was no cool down period that was a routine thing. And I guess my question that's added there is was there time to change -- in other words, during the time that it

took to change a casting from one to the next one was that sufficient time to allow the -- the machines to cool down? And I'll just preface it by saying that in the Los Alamos safety manual it was quite clear and very explicit that there needed to be a cool down period after each major exposure of the betatron that they had. So I'm just wondering if that rule was observed at General Steel. .

: No. No. We had no cool down time. When the betatron shut off the operators went to the shooting room, removed the old -- the old

film and set up a new shot. Oftentimes we were waiting for that last picture to see if the casting had cleared. Oftentimes I was spurring the operators on to get me that film as quickly as they could. I accompanied them to the castings many times. On some occasions they took it down and handed it to me and I -- and I carried it back into the -- to the processor. Sometimes, depending on how they felt, being a union shop they said that wasn't my job and they'd carry it in. But nonetheless, a lot of times there was a hurry to get that film. It took 11 to 13 minutes to process the film, another few minutes to read it. Within 15 minutes many times we were already running that -- that casting back out in the 10 Building to either be

cleared or further repair done to it. A lot of times they were on a tight schedule to get that casting in and out.

: And then the -- the next casting would be ready to come in to start work on it?

: That's correct.

: Yeah. Okay.

: And oftentimes we had that casting already in there. We -- we -- we had --

: Okay.

: -- it the way we want.

: Okay.

: But -- and -- and routinely when the betatron shut down the operators would -- would move immediately out to set up another shot.

: Okay.

: Was that the normal time frame from a shot when a camera shut off to get a casting out in the 10 Building, about 15 minutes? Is that pretty --

: If -- if it was on a -- if it was on a crisis basis, on a hurry-up basis.

: Okay.

: Some -- some castings of

course we had four or five hundred shots on. So they -- they stayed in there for days. But --

: Uh-huh.

: When they were done being shot, the time frame to get back out for other workers or moving them out of the room was about 15 minutes?

: That would be the minimum amount of time.

: Okay.

.: What -- what would be sort of a average time would you say? Let's say it was normal operations which I understand were steady throughput. But what would be a --

.: Oh, I would say within a half an hour's time after the last shot was made they were being moved.

: Fifteen minutes to a half an hour then?

: Uh-huh.

.: Okay. Very good. Is there anybody who has anything new to add to that? I think

22 we've heard from other meetings that that was a -- the
23 general -- that everybody agrees with that pretty
24 much. So -- but more to add?
25

1 : Yes. What I objected to after
2 each shot in the shooting room -- I read up on what is
3 referred to as a residual radiation. Yet, the
4 department head at that time insisted that the minute
5 the betatron would kick off you better have the film
6 cassette in your hand all -- to go out there, and you
7 had to go into the residual radiation. And I objected
8 to that greatly, but he says he'd be responsible for
9 that. So --
10 : Well, I want to ask a
11 follow-up question. That -- what you just said is
12 extraordinarily important. So when -- when -- when
13 the word residual radiation was used, what -- what did
14 that mean to you?
15 : That there was radiation still

16 around the casting and between the betatron and the --

17 where you had to set up the film in the casting.

18 : Even though the machine

19 itself had cut off?

20 : That is -- books tell you.

21 They wouldn't tell you, but the books did.

22 : Uh-huh.

23 : And -- or they wouldn't agree

24 with you.

25 : No. That's fine. But the --

1 the important point is you realized it and you brought

2 it up then.

3 : That is correct.

4 : All right.

5 : And they said -- but they says

6 you better get moving the minute the betatron -- in

7 order to get the production or we -- or they were

8 falling behind on production, we were losing

9 contracts.

: This is a good time to bring up then a related topic which is was -- did anybody see or was there a betatron operating manual? In other words, I -- I think I've heard before that that -- the answer is no.

: No.

: But that's a rather astounding fact to me. This gigantic particle accelerator and there were no manuals around that would tell anybody --

: It was word of mouth training from the older, you know, operator --

: I understand.

: -- to the assistant. And that's where you got your training. And like I said, I think we should have had time to take the MacBeth

survey meter each time and check the area before we put up another x-ray, but they disagreed.

: Well, expand on that a little

bit. So -- so the MacBeth survey meter was present, right?

: Yes.

: It was just a matter of deploying it --

: That's right.

: -- to make measurements?

: We were supposed to check the shooting rooms and the -- and the area every hour --

: Okay.

: -- which we did and maybe oftener (phonetic) especially when we used sources. But like I said --

: Well, that's good. Now -- now, when you used a source or what was the procedure if you found a high reading or a reading that you thought was too high?

: You find out what the trouble was.

: Good. Okay.

: Yeah.

: Would you -- would -- and

would there be a level of concern that would make this a reportable incident where you'd actually write it down or --

: You'd write it down.

: -- where you'd tell it to your foreman?

: But it was never that great --

: Okay.

: -- where they consider it damaging.

: Okay.

: Yeah.

: I specifically remember --

: , yeah.

: Pardon me. I specifically remember of no training that I was ever given on the betatrons other than training handed down by preceding operators as on-the-job training. The fellows that operated the isotopes had AEC licenses and were

trained in such a manner. But I was always told involved with the betatrons there was not a license required.

: That's right.

: Okay.

: I specifically remember on these occasions all of us fellows fired many 10,000 roentgen shots and over.

COURT REPORTER: 10,000 what?

: And when we did so --

COURT REPORTER: 10,000 what shots?

: Roentgens, ma'am.

: R-O-E-N-T-G-E-N. It's an old -- it's really an obsolete but old term for radiation exposure. Yeah. Thank you. That's fine.

: When we did fire these shots we were given specific orders. As soon as a machine quit and that red safety light quick blinking on the door we were so set up the next one immediately.

15 : Okay.

16 : There was absolutely no cool

17 down time granted, sir.

18 : Okay. you had a

19 comment.

20 : The comment

21 that -- especially on Westinghouse castings where you

22 would shoot a lot of shots for 45 minutes to an hour

23 or longer they were shot at either six foot or nine

24 foot. To measure the distance we had a string from

25 the -- from the cone on the -- on the -- on the

1 accelerator that you used to measure to the casting.

2 : Okay.

3 : Many times when I would be

4 shooting six-foot shots I would be right up against

5 the machine. If you got your arm next to the cone

6 where the radiation emitted it'd make the hair on your

7 arms stand up.

8 : Yes. Uh-huh.

9 : What was the real reason for
10 that hair to stand up on your arm? I would like to
11 know.
12 I : Well, the -- the betatrons,
13 you know, that's -- it's just tremendous intensity
14 that it actually -- it ionizes the air, but it also --
15 that word charging. It actually activates the air
16 particles. So any molecule in the path of that beam
17 would be activated. And what that means is it
18 disturbs the electrons in the air. So you certainly
19 have circulating oxygen, some nitrogen, all of that is
20 charged and it creates a secondary electric field.
21 And -- and that's -- that's what you're feeling when
22 you're -- when you're doing that. Some people in
23 other places that I know who have used betatrons or
24 linear accelerators said that you can even smell the
25 effect of activation in the air. Now, I don't know if

many occasions when --

: Right.

: -- when you would shoot on an excessively long shot --

: Correct.

: -- that the -- and you worked up close to the magnetic field that it'd make your hair stand up on your arms or your face or wherever.

: Uh-huh. Well, there is a strong magnetic field in there too. So it really can be both. It can be an electrical current; i.e., ionization and it can also be the magnetic piece. Yeah.

: That's what -- I wanted to make this comment mostly I don't know what -- it's a plus or a minus in -- in the argument of what we were doing, are our bodies accumulating or these --

: Right.

: -- this magnetic field.

: Right. But as far as current theory goes probably the magnetic field itself didn't do anything. But the -- the electrons, the gamma

25 rays, the neutrons which you didn't have any way to

1 measure I don't think, all those things could have
2 done something. So yeah, that's important. And --
3 and the secondary activation of other molecules in the
4 targets, in the air, in the building components, all
5 that is very -- is important. Yeah. Okay. Thank you
6 very much.
7 : Thanks.
8 , you had a comment?
9 : This is We
10 used to go over there and inspect them Westinghouse
11 castings, me and . And you could feel the
12 hair on your arms stand up when you were walking
13 around inspecting them castings.
14 : After the machine was off; is
15 that right?
16 : I don't know whether the
17 machine was off or on. I didn't even -- I didn't work
18 there.

19 : When you were walking --

20 : I was a supervisor.

21 : Right.

22 : And was the

23 inspector.

24 : I understand.

25 : We'd go over there and look

1 at these castings.

2 : After they had been in the

3 betatron, is that what --

4 : After the betatron. Yeah.

5 : That was in the betatron

6 building?

7 Yeah.

8 : Okay. So there was some kind

9 of a field around those castings after the machines

10 were shut -- you wouldn't be there if the machines

11 were on?

12 : No.

13 .: And you -- you could feel

14 that with the hairs on your arms.

15 :: You could feel it when you

16 was walking around them castings.

17 .: Okay.

18 ": Were you wearing any kind

19 of radiation monitoring equipment?

20 :: No.

21 .: Did you -- did you -- well,

22 I'm sorry. Just one second. Did you ever bring that

23 up to a -- your supervisor, foreman, coworkers and --

24 :: Sometimes --

25 .: -- get any kind of answer?

1 : Sometimes the supervisor was

2 with us, and they'd just laugh about it.

3 .: Oh, they laughed. Okay. All

4 right.

5 ": On the old betatron --

6 : Name we need.

: Okay.

: On the old betatron before they built the new one I have went in there to pull the casting whenever they was shooting and they -- we'd go in there and we'd pull the flatcar out and put another casting in there. They had two castings in there at the same time.

: Okay. Good. All right. Let's see. I think we've covered Affidavit No. 6. But if I may I'll just read it into the record. That's about workers who can testify that shot records -- and I'm think we're talking about the betatron shot records in particular -- the x-ray results, check lists, and the x-rays existed and were sent back to Mallinckrodt. And I think we've had testimony today, would you agree, , that that --

: Yes.

: -- that all happened? So I

just -- this is a chance if anybody had anything in addition to add to that, this would be the time to do it I guess.

: Anything more about the shot records?

: The only thing I'd have to add to that is that the --

: This is

: I'm sorry.

: That's okay.

: The film and the shot records were usually packaged in -- in one of the boxes that the film came in, they were the right size. And after they were used we put the film and the shot record back in there and usually wrote on the outside of it who it belonged to, Mallinckrodt, the casting number. And there was an identification somewhere on that, there had to be. We did that with Westinghouse. We did that with GE, all the customers we had except the Navy film we kept because General Dynamics -- electrical division of General Dynamics would come in and read the film after we were finished with it to

see if it was acceptable or if we had to do further repair work on it. Those films were kept at the plant

if I'm not mistaken down in -- in the basement of the 6 Building --

: That's important.

: -- for the electric division. They weren't sent back with the -- with the castings.

: , can I ask you this. I -- I think that's extraordinarily important. Do you know -- not the films themselves but the -- the reports, were copies made and kept at General Steel, or was the -- was the original just an original and it was sent back with the records? I mean, it would seem like the company would need some sort of internal recordkeeping just to prove what they had done. I -- I guess to me I would think they would have kept a copy. But --

: I -- I'm not sure. We used -- we used -- some of these castings were

similar. We -- we shot the same castings or their -- their mates over and over again. And we had a -- we had a map drawn with where the shots belonged and we had a standard shot record we pulled from the file. Yeah. We had filing cabinets. Sure, we did. We had filing cabinets with those shot records in them.

: Do you remember though -- I -- I mean, I really -- I have no idea. I mean, were

there copy machines that you could make copies?

: No.

: Okay.

: No. There were copy machines up in the -- up in the front in the offices, and we had -- we had blank copies.

: But you don't remember sending -- routinely sending your reports --

: No.

: -- whatever they -- the ones that you put back in the film boxes, before you did

that you don't remember making a copy --

: No.

: -- that would be saved by the company?

: No. I -- I don't think we did.

: Okay.

: We -- we had blank copies and they were filled out by the layout man --

: Okay.

: -- specifying what shot to be taken, how many Rs to shoot it at, what distance to shoot it at, and -- and so forth. And the operator would check that -- check that off when he got

finished shooting it.

: But now even --

: May I -- can I just say one thing?

: Sure. No. This is

important.

: Was it --

: This is now.

Let me -- let me put this.

: Was it possible that those were self-copying copies, like were they double sheeted?

: No. No. These were -- these were just white paper copies, rather heavy paper too. They weren't like the copies that you see today. The layout man would grab a blank sheet and fill it out, and that would stay on the -- on the console I believe. It would stay right there until the casting was completed. Is that not correct?

: Right.

: Because of the following shifts had to know which shots were shot and which shots they had to shoot and so forth. And they were checked off.

: , would you

comment on that please?

: Yeah. We had to check off.

: I -- let me just preface it by saying it's still exceedingly odd to me that a company would not want a -- some record of a gigantic, major job. I know you did a lot of work, but how would they keep track of it to cost account the contract for example?

: I don't know how they kept track of the film.

: Okay. All right.

: Every shot we made we had -- they had -- as you say they had a sheet we had to mark off each shot.

: I understand that. Right. That's clear.

: Right. That's the only record that we kept.

: But -- well, is it your recollection as well that those -- those shot records were put back with the film and sent off to the

22 company, to the client let's say?

23 I really don't know.

24 : Okay.

25 : The operator didn't have

1 anything to do with the shipping of it.

2 : Okay.

3 : All we did was mark it off

4 and give to the clerk or the supervisor maybe.

5 : Got you. Okay. So that was

6 handled somewhere else --

7 : Right.

8 : -- up in the office. Okay.

9 Got you. Well, that's great. Thanks.

10 : So there's absolutely no

11 doubt that there were shot records and x-rays for

12 every casting?

13 : Any time we shot each and

14 every casting there was a master shot record used for

15 each and every casting. What happened to these

16 records after we marked off each individual shot and

17 the casting was completed we don't know, sir.

18 : Okay.

19 : It was turned over to the

20 front office and they did whatever.

21 : That would definitely

22 include the Mallinckrodt products?

23 : I would say so, sir. Yes,

24 sir. Uh-huh.

25 : Okay. Thank you.

1 : Okay. Let's move on. We --

2 I think we're doing great. I think we've been at

3 it -- I think we ought to take a five-minute break and

4 give everybody and chance -- do you all need a break

5 to go to the bathroom or --

6 : I take water pills, I --

7 : Me too, . So I mean, I

8 know we can all go -- you can go any time you want to.

9 Let's have a short break and we'll come back in about

five minutes.

(Whereupon, a short recess was taken.)

: Okay. Because ' ;

has to go to a doctors appointment I want to read in Affidavits No. 7, 13, and 15 and then give him a chance to comment. Affidavit 7 asks for workers who saw and can describe the cobalt 60 -- I said x-ray source -- but it's really a gamma source in Plant 6 and also workers who can describe the physical aspects of the shooting area in Building 6. In particular what kind of materials were tested there, what were the safety precautions, what were the warning signs?

Affidavit No. 13 asks for workers who know about ingots and castings that were put on company railroad cars. This is cars now not from outside but that the company owned that went through at the plant

buildings. And we're interested in any details about those cars and the rail details, you know, where the cars were stored between moving the castings, where

the rails were placed and so forth. And the reason of course is that -- that because they carried castings and ingots and materials that could have been made radioactive and were radioactive this was a way to spread radioactive contaminations throughout Building 6 through 10.

And then Affidavit No. 15 asks for General Steel records that were burned or discarded and how and to what extent was this done. Was there an order given by the company to get rid of all of the GSI records and can we specify what company official or officials gave this order and an approximate date.

And so , would you comment on any of those things that you think might be appropriate.

: My name is First of all the railroad cars, they went all the over the plant. They wasn't stored no place. They just went in and out of the buildings, taking all the buildings and they'd put company castings on them and take them to different buildings.

: Okay.

: Even when we went in to the old betatron with them. And the same car that went into the old betatron went in every building too. And --

: Were the cars -- were they dusty?

: What, them cars?

: Yeah.

: They had sand, dirt, rocks, whatever's loaded on there, that'd fall on them they just -- they was on them.

: Were they ever cleaned?

: They cleaned them about once or twice a year. And -- and behind the betatron we dumped sand up on top. And we was higher than the betatron when we was dumping this sand. And that would -- they was always kept down by the sand system, the dump cars were.

: And why -- why were you -- what was the sand doing?

21 : It was the sand that they

22 shook out of -- of the molds and that, you know.

23 : Okay. Uh-huh.

24 : Core sand I think it

25 probably was.

1 : And they stored, just

2 storage.

3 : Core sand?

4 : Yeah.

5 : Yeah.

6 : Core sand, C-O-R-E sand?

7 : They made the cores out

8 of sand. Then they --

9 : Got you.

10 : -- poured the casting and

11 some of it would hang on.

12 : Right.

13 : Some of it would get

14 inside the casting.

15 .: And it was stored in the

16 betatron building for convenience? I guess that was

17 --

18 : No.

19 : No.

20 :: We dumped it behind the

21 betatron, all up behind it.

22 .: Dumped it behind. Okay.

23 : And we was higher than the

24 betatron when we dumped it. And then about the

25 burning of the records ', the plant

1 superintendent I guess he was --

2 : So , would that be

3 like ?

4 : Yes.

5 .: Okay.

6 : He -- he was there, and he

7 gave me the orders to burn. He said any papers that

8 -- that comes out of these here vaults you burn them.

So that was down in the basement of the main office. And I burned them. And then we went into the --

: Did -- did you know -- can you tell us anything about the types of records? I mean, were they financial records?

: No. I -- I didn't read any of them.

: Okay.

: I looked at some of them. There was some old checks from way back in '42 when I --

: Okay.

: -- worked there the first time.

: Okay. Got you.

: They was all the way back there, and he said don't save none of it.

: Okay.

: He said you burn them checks

too. I wanted to keep my checks, all them checks I had. He wouldn't let me.

: There you go. Okay.

: And then we went into the employment office and everything that was in there was in files, all but the -- the little cards they made up when you went to the dispensary when you got hurt or anything like that was -- it was on this little card. They kept them file cabinets, and the guys from the St. Louis office out in Clayton came and picked them up. There's -- there's five -- it's -- well, the cabinet was pretty -- bigger than a regular file cabinet.

: Uh-huh.

: But -- and they picked up that and five other file cabinets. That's all the records that were left.

: And that just -- I really am -- I don't understand. So the Clayton office -- this was another General Steel main office?

: That -- that was their main office.

25 : Okay. Got you. Okay.

1 : See, they moved from -- from
2 Commonwealth to -- and the main office there they had
3 on Commonwealth, they moved to St. Louis out in
4 Clayton.
5 : Got you. Okay.
6 : So he was -- it was the
7 office over the pipe company and all and -- and the
8 car company down there in South St. Louis, St. Louis
9 Car Company.
10 : So -- so just if I can
11 summarize then. So what I hear you saying is records
12 that had to do with medical treatment and things like
13 that, they were saved and sent back to the --
14 : Main office. Yeah.
15 : -- the main office. But
16 other records --
17 : Other records all was there.
18 I don't know what was all them, but --

: But they were destroyed?

: Destroyed.

: Okay. And this was about the same time? Saving and destroying was going on at -- at what year would you say that was?

: That was in '73.

: So that was when the company was winding down, going out of business?

: Yeah.

: You were basically the last --

: I was the only one left.

: -- person around, right?

: I was the only one in there besides

: Okay. All right.

: Me and I was the only two left.

COURT REPORTER: I'm sorry, sir. I didn't

hear what he said. I didn't hear the last thing you said.

: Me and was the last two left in the plant.

: The last of the regular employees at General Steel left at the plant?

: Yeah.

: Okay. So who told you to -- to destroy the records?

: Oh, did. You -- you, , you -- you were it?

: Uh-huh.

: All right.

: And was the plant superintendent at the time?

: Yeah. Uh-huh.

: Okay.

Plant manager.

: Plant manager.

: Yeah. Thanks very much then. Is there anything else that -- that's good.

: Building 6, we were interested in Building 6 and the nondestructive testing.

: On the Building 6 and the cobalt treatments was made out of concrete blocks. It was -- made about over half the building at the -- let's see -- west end of the building. And it didn't have no roof, and it was about eight foot tall. And they picked up the castings out off of the 6 Building floor and picked them up, went over the top, no roof on it and set the castings down in there when they shot them.

: And this was with one of the cobalt sources, right?

: Yeah.

: Okay. Is that the source you

all called the small source?

: I don't know what they called it.

: Yeah. That was the small source, the 6 Building.

: Okay. And how -- and -- and was the iridium source used in there, or was that used elsewhere in the plant?

: It was used absolutely all over the plant.

: Okay. All right.

: They'd take x-ray -- cobalt treatments outside the old betatron.

: Right.

: And castings outside of the old betatron.

COURT REPORTER: What's he saying?

: Betatron.

: He said outside the old betatron building.

: They shot them on the outside of it.

: Were there other workers

24 working in Building 6 when this was going on?

25 : Yeah. They was running

1 Building 6, out on the floor chipping and everything

2 else. The crane was up, the crane.

3 : Did any of those people

4 have radiation badges?

5 : No. None that I know of.

6 And --

7 : And just for the record,

8 So here -- here we have a cobalt source that's used in

9 a building without any roof, right?

10 : Uh-huh.

11 : And so the idea is that that

12 -- once that window is open and the little pill is out

13 there it's basically radiating in all sorts of

14 directions.

15 : Yeah.

16 But did anybody -- I mean, I

17 guess this is a good time to put on the record was

there a safe -- a radiation safety person who was in that area looking at that, monitoring that, making sure that people were not being overexposed?

: I don't know. I wasn't -- I didn't work in the building. I just went in through it, in and out of it all the time.

: Well, I mean did you see anybody there that was --

: No.

: -- performing that kind of job?

: No. And I didn't see no signs on the -- on the concrete block building either.

: Okay. We -- we've heard -- we've heard two different stories. Some people -- many people say no signs at all, and then I think we've had one or two reports, did we not, that somebody said they -- the building did have radiation symbol signs?

I didn't see them.

Didn't see them? Anybody else see them?

Yeah. They had -- we had radiation -- those little radiation signs.

There was a sign on that building?

Yeah. There was a sign.

How close would workers get to that building?

Oh, right up to the walls.

Okay.

I'd like to make a comment on that.

Yeah. Right --

Yeah. I'd like to make a comment to clarify a concept. It appears that you have in your mind that this is a building out by

itself. This was just an area inside -- inside the 6 Building. Yes.

: Inside the building. I'm sorry. No. I'm aware of that.

: Okay.

: And -- and but -- so there's work -- there's this concrete block area, enclosed area without a roof inside the -- the Number 6 Building and there was all sorts of work going on?

: Around it.

: Yeah. And -- and that was the -- like the - -the truck car -- the trucks for the railroad cars --

: Yes.

: -- and things like that, right? Okay. No. I understand that. So it was a busy area? It was --

: Well, it was --

: If radiation was coming through the walls or bouncing --

: There could be --

: -- going out the top and

bouncing down?

: There could be 60 or 70

people working inside that building when it's, you

know --

: That's very important. While

this was going on?

: While it was going on.

, the building was right

next to the main foundry pathway also.

: Okay.

: All them guys was out there

in the foundry.

: So the Number 6 Building

with this radiation testing area --

: Was next to the foundry.

: -- was right next to the --

: The foundry.

: The foundry.

: -- the Number 1 or main

22 foundry?

23 : Yes, sir.

24 : Yeah. Right to the right.

25 : Any doors?

1 : No doors.

2 : Okay. Thank you.

3 : And the final thing on

4 Building 6 and that source, what would you all say --

5 I mean, was that facility in use almost all the time

6 or --

7 : Yeah.

8 : -- once in a while?

9 : The biggest part of the

10 time. That was used more than any -- any time that I

11 know of.

12 I : This is saying

13 that it's in use -- I'm sorry -- most of the time,

14 would you say?

15 : Most of the time. Uh-huh.

: Okay. Other -- other comments about Building 6 while we're on that topic?

: As -- as you were saying --

. As you were saying, , work was going on in -- around the whole perimeter of that building. It was on the -- that building was on the west end of 6 Building. Right directly outside of that building would be side trucks under frames, all types of work by clippers, burners, welders, crane men knocking off I guess they would call them --

: Risers.

: -- risers off of these castings. This was going on constantly while shooting was taking place,

: Okay. So let me ask just the final question of that that occurs to me. So by even the rules at General Steel shouldn't there have been an isotope person supervising that work or in that area? I -- I'm not hearing anything about that. I'm

talking about the Number 6 Building.

: There was none.

: There was none there.

: The only person that was kind of in control was the guy that was in there doing the shooting, the operator.

: The operator.

: Nobody else was around except for the people working.

: That -- that operator --

: The operator was the only one that had a film badge.

: Oh, he had a badge. Okay.

: Well, he had a film badge. Well, you wore your film badge at all times and your -- your dosimeter.

: Right. But I mean, he was one of the people who had a badge, had a dosimeter.

: Right.

: Okay.

: The operator and his assistant.

: And the operator would have been a betatron person that we've been talking about?

: Right.

: Okay. I'm with you.

: The -- the -- the one comment I would like to make is outside of that concrete block room you had all of your -- your -- I worked down there a lot of times with the Magnaflux on the transit authority underframes. And the -- like the gentleman said there was -- there was people working all over in that Number 6 Building outside the concrete blocks, had no idea what was going on in the inside.

: Right.

: The only person that had any -- and -- the operator on the inside doing with the cobalt unit was the only guy that had a dosimeter or -- and his badge that could detect any radiation.

: Right.

: Everybody else was cold turkey.

: Yeah.

: We asked -- one of the questions in the affidavit was do you all have a sense of what type of materials were being x-rayed in that -- in that 6 Building. I mean, were -- were they truck castings? Were there --

: Yeah.

: Mostly truck castings.

: Okay. So we were looking for structural flaws again?

: I don't know if they put anything else in there or not.

: Okay.

: Generally they did --

: They'd put an underframe in there.

: Okay.

: It was big enough to --

: you were in the foundry I thought.

: Yeah.

: Can you tell us something about that?

: I believe -- I believe this is where they x-rayed that magnesium, rock crushings, the metal of that too in the 6 Building.

: Uh-huh.

: Are you talking about manganese?

: Manganese.

: Yeah, manganese. And it's the small -- a lot of the small castings went there to be x-rayed.

: Okay.

: That's where this beryllium steel, it was like a tube they made for a submarine

15 that's supposed to have 35,000 pound of steam
16 pressure, and that's where it went for x-raying.
17 : What kind of steel?
18 : It's supposed to been the
19 kind that had that beryllium, that's what I heard them
20 talking about.
21 : He -- he's talking -- are you
22 talking about beryllium?
23 : Yeah, beryllium. Yeah.
24 : Okay. So that would be
25 B-E-R-Y-L-L-I-U-M.

1 : But there was this -- it was
2 a round tank and it was made like a Y out of -- up
3 here on the end it had little pipes, and it's supposed
4 to went for a nuclear submarine. And they said it had
5 to have 35,000 pounds of pressure, steam pressure in
6 it.
7 : They did that
8 for a while down there, then they moved it over to the

American Steel. They had a one million volt KVP over there, and we leased that for that kind of work that he's talking about now.

: These parts were for nuclear submarines?

: Right. And they're -- then we started shooting them over there at American Steel. Me and used to go there all the time and shoot those.

: Yes. We did.

: And back to the 6 Building, that -- that pill was not even secured. The door was not -- they didn't have a door there for a long time.

: Door on the building?

: On the little block building.

: Yeah. No door?

: Well, they had to put a door up there because somebody -- some guy went in there

and stole the pill. He thought it was plumb bob.

COURT REPORTER: Thought it was a plumb bob?

: One of the workers, yeah, he -- and finally they put out that it was a real dangerous thing, you know, and he brought it back.

: So you're saying the cobalt source was taken?

: It was taken.

: Was it returned?

: Yeah. He returned it after the -- the word got around that, you know, he might die or whatever. But he thought -- he thought it was a plumb bob. They didn't even have a radiation sign there.

: We found it on Logan Street in --

: you know where they found it?

: Yeah. On Logan Street in North Venice.

COURT REPORTER: In North Venice?

25 North Venice.

: Who found it?

: The police.

: Okay. So the source disappeared, went home with somebody?

: Yeah.

: Yeah.

: It stayed there for about two days.

: Yeah. Then they put a door up there with that radiation sign. And that was the only place that they had a radiation sign was on the -- on the door.

: Okay. So that kind of verifies the fact that you said the radiation source wasn't necessarily real secure in that building.

: Oh, no. It was not secure.

: Okay. So it --

: The crane operators was told

when -- when they was shooting down there only to go halfway down the building, but they went farther than half way.

: Okay.

: Now, you said that Number 6 Building was attached to the foundry; is that correct?

: Yeah.

: All -- all the buildings were --

: There was no wall though. It was just a --

: No wall? What products were made from Number 1 foundry?

: What?

: What type of products were made in Number 1 foundry?

: That's where you poured the steel.

: That's where you poured the

steel.

: Would that have been for the whole plant?

: For the whole plant.

: Castings, molds, moldings.

: For everything?

: Everything.

: Yeah.

: So everything that was made at GSI in that foundry -- or was made in that foundry --

: Yeah.

: -- and then taken out, and

that foundry was attached to 6 Building?

: All the buildings were attached to that foundry.

: All the buildings were attached to the foundry?

: If you look -- if you look

at that map we have of the buildings --

: Yeah.

: -- the foundry is a long building like this, and all the other buildings are like this coming off of it.

: Were there big doors on all those?

: No.

: No. It was just open. You just -- when you walked through --

: That Building Number 1 was a quarter of a mile long, the one building. The other buildings had --

: Everything attached to that foundry?

: Yeah. There'd be mold --

: And that foundry attached to Number 6 Building?

: The molds was made in 2

Building and took out into 1 Building.

: Okay.

: That's where they set the cores and made the -- poured the metal.

:

: Yes, sir.

: J : When they poured the heat in the foundry these gases, steam would billow in through all these buildings.

: Okay.

: Anything that joined the foundry, that smoke would carry into all these areas.

: The Number 6 was right --

: Right in the middle.

: It was just right --

: Right there.

: -- right in the middle of the Number 1 foundry if I looked at the map correctly?

: Right by the open -- and the electric furnace.

: As a matter of fact, at one time they had --

: This is that's

24 talking.

25 : They had an incident where

1 -- you have to understand these molds that are either
2 dry or green. When they're green that means they have
3 moisture in them. They can't pour hot steel into
4 anything that has moisture in there. One time they
5 did accidentally pour hot steel into a green casting,
6 and it shook the dust off the rafters of every
7 building in that plant.
8 : So there was an explosion?
9 : Yeah. It was an
10 explosion.
11 : What year would that have
12 been?
13 : About '55 or '6.
14 : Okay.
15 : I mean it --
16 : Anybody injured?
17 : A guy -- a guy that was

18 operating the ladle was hurt some, but not killed.

19 : Okay. Thank you.

20 : I was the one that helped

21 poured that heat. And that was a ring that blowed up.

22 What happened it sucked the moisture in from the

23 outside. They had a big snow on the ground. And when

24 it -- that heat hit it it sucked that moisture inside

25 of it, and it exploded. And it -- a lot of people got

1 burnt, but nobody real serious, you know.

2 : Okay.

3 : But it burnt two cranes up.

4 : But it shook the dust off

5 of every --

6 : Yeah.

7 : -- building in that plant

8 I'll tell you that much. It busted a lot of windows

9 too.

10 : But I was --

11 : Did they have to call the

fire department or anyone that we know of?

: No.

: No.

: Not that I know of.

: No?

: I was -- I was standing on a truck that had four rubber wheels on it, and it burned the wheels off from it and me standing on it. But it was -- it was pretty bad.

: Okay.

: Can I pick up on one final point? I'm sorry. Somebody mentioned and I need to have this -- I think this is important for the record -- that the crane operator in Building 6 --

Wimp, was this from you?

: Yeah.

: And let's -- I want to make sure I understand what you said. So the crane operator normally goes down a certain -- traverses --

: Well, it runs all the way from one end of 6 Building to the other.

: But they're not supposed to go all the way down to the west end of the building where the --

: Right.

: -- where the source was used in the block building?

: When they're -- when they're -- well, when they were shooting it. When they were to supposed to be --

: I understand. But you're saying that sometimes they did?

: Yeah.

: So -- so the implication of that is that the crane operator may have been exposed to that source as he was up above the source and the -- the radiation was going upwards?

: Yeah.

: Okay.

: , one more question on that. If the crane -- or the crane operator was told to stay back at the other end of the plant, what about the regular workers?

: Huh?

: What about the chippers, the welders, did they leave that end of the plant?

: Well, they was all down at the end. They didn't --

: They were down there.

: They were protected by the wall, you see.

: So the crane -- the crane operator was told to get back, but the other gentlemen stayed and kept working?

: Oh, yeah.

: Okay.

: Okay.

: And between the 6 Building and 7 Building and wall at the end of this brick building there was face plates, steel plates in the

floor where they measured the castings, you know, set them on face plates and if they bent or whatever it was, that was it south end of the building.

': Okay. Thank you. You've

been very helpful. I know you need to leave for a medical appointment.

: Okay. That's -- that's -- that's great. Okay. So we're --

COURT REPORTER: What kind of plate?

'I: Face plate, F-A-C-E.

.: Face plate. Okay. Yeah. I didn't hear that one well either. All right. So I think we did a great job on Building 6. And I think just for the record Affidavit No. 8 topic was workers who saw and can describe the 80 Curie Cobalt 60 x-ray source used in the betatron buildings. And it seems to me that we probably have a pretty good description of those. They were round, they had a door, they had a crank that they were opened, the pill came out. Is

there anybody -- is there anything else we need to add about the -- the -- what we'd call the big cobalt 60 x-ray source that we haven't talked about this morning? , have you got any comment on that?

: That -- : They were strict -- they was strict that the big source was strictly used in the big -- in the new betatron.

: Okay.

: That was the only place that

they used that.

: That's important.

: Right.

: So the big source was in the new betatron?

: Right.

: And -- and according to what we've heard today -- so it was -- was it also stored there in between?

: It was stored there in between.

: And it should have been locked. And do you think it was locked most of the time?

: It was locked until --

: Okay.

: -- you got ready to use it.

: Until it was ready to be used.

: Uh-huh.

: Okay. All right. I think that should take care of that. I'm sorry,

: . To -- to the best of my knowledge -- to the best of my knowledge the 60 or the -- the big curie source was also stored

in the lab basement; is this correct,

: Correct. We didn't use it every day.

.: It wasn't permanently stored in the betatron -- new betatron building.

: So it was stored both places possibly?

: Yes. And it was --

: I'm sorry, But when you say the lab, are you talking about the metallurgy lab?

: Or the chemistry lab?

.: Yes. The metallurgy lab.

: The metallurgy lab.

: Okay.

could verify that fact.

.: Okay. Good. Now, the next topic is the one -- this may be something we know the least about of any of the sources, but it could be real important because it was used all over the plant. And that's workers who can document and describe there was a iridium, I-R-I-D-I-U-M, 192 source and where and how often it was used. So my -- my question is I have not heard a single individual who actually saw the

1 iridium source, and it would be extremely useful if we
2 could get a description of what it looked like. Is
3 there anybody that could address that for us?
4 , the iridium source?
5 : Okay. I'm , and I
6 have used the iridium source.
7 : Good.
8 : We used to wrap the outside of
9 large -- on a steam generating plant or the -- or even
10 the nuclear channel heads we used to wrap the film
11 around it.
12 : Okay.
13 : And we'd put the source in the
14 center on a tripod.
15 : Okay.
16 : And we'd put the source in the
17 center. And then we would crank it out, and it'd
18 x-ray the tapered areas where the huge fittings would
19 be mounted onto when it got to its destination. And
20 like I says, it was not on a cart. It was a portable

21 unit, and they usually rented it from -- or leased it
22 from St. Louis Testing to --
23 : Okay.
24 : -- or Pittsburgh testing to
25 the best of my knowledge. We have used it, and --

1 : How large would you say it
2 was, just like a, I mean, basketball or --
3 : 150 curie.
4 : No. No. No. I -- yeah.
5 150 curie in intensity. But how -- physically how
6 large was it?
7 : It was not that large.
8 Iridium didn't require a big pig --
9 : Bigger than a basketball?
10 : -- on wheels like cobalt did.
11 : Okay.
12 COURT REPORTER: A big pig? Did you say
13 pig?
14 : Yeah. Yeah. We called it a

pig. It's a container.

: A pig was a lid container --

: Large.

: -- that -- that shielded the source and also contained it.

: Like a vault.

: Yeah.

: Uh-huh.

: Okay.

: And like I says, and myself were usually the ones. Yeah. And in fact,

there was a small iridium source St. Louis Testing used to use on what we called the sand pile outdoors.

: Okay. All right.

: And of course, that was our terminology of it. And they used to shoot outdoors certain times.

: Well, maybe we -- that will come up. But why don't you just keep on with that

because we've heard about St. Louis Testing. Now, what kind of things would they shoot outside? I mean what kind of --

: Some pipe welds.

: Okay.

: Yeah. They'd -- I don't know if a outside vendor or our own welders would do it. But they added pipes onto turbines and they'd get --

: In the -- in the literature that I've read about iridium sources they're still widely used.

: Yes.

: And the modern ones can be very small, and they can be sort of --

: Oh, yes.

: -- molded so you can wrap them around. But -- but pipe welds are the things

that I've heard --

: Yes.

: -- have been used a lot.

: Uh-huh.

: I just saw a --

: So I got to use it a few times.

: Okay. All right.

: Thank you.

: Good. That's perfect. That's -- that's what we needed to know. And can I ask you just one follow up on that?

: Yes.

: Again, I'm trying to get some sense for NIOSH --

: Uh-huh.

: -- of whether that was a very occasional thing or a routine thing or how often would you say you and used that source?

: A few times. It was not a scheduled thing I don't think.

: Twelve times a year?

: No.

: Six times a year?

25): Yeah. Possibly.

1 .: Okay.

2 ': Yeah.

3 : That's great. All right.

4 , I think

5 Brawley had a comment.

6 .: I'm sorry.

7 ': Now that mentioned it we

8 -- I've also used it too because we used to wrap film

9 all the way around that -- that fitting.

10 ': Right. Correct.

11 ': We'd have like -- we used to

12 use the soft holders for that. Remember, they

13 were green.

14 ': Flexiwrapped.

15 ': Yeah. We put it in the

16 center, and that way we can get maybe 20 shots instead

17 of using the betatron to get one shot at a time.

18 : And the reason you'd use the

19 iridium was because it was smaller and it was easier

20 to get inside and --

21 : It was smaller. It was

22 smaller, and the metal was really too thick for

23 betatron -- too thin for the betatron.

24 : Okay. Got you.

25 : Because they -- if they shot

1 it with the betatron, they had to use a more expensive

2 film which is M film.

3 : Okay.

4 : But you could use --

5 : I'm sorry. Say --

6 COURT REPORTER: What kind of film?

7 : M.

8 : Like the letter M?

9 : Right.

10 : Okay.

11 : But with -- with the iridium

12 we could use double A which was a cheaper film.

13 .: Double A. Okay. Very good.

14 Excellent. All right.

15 ':

16 ': This is again.

17 Iridium was used because it gave a very definite x-ray

18 film. You could see many things you could not see

19 otherwise. But using iridium would really bring it

20 out. Thank you.

21 .: That -- that's also what I've

22 heard, and that's why wells were -- I saw a historical

23 documentary that it was used also even on the Alaskan

24 pipeline when they built that. And in fact, when they

25 -- when they used the iridium source they had to scrap

1 large amounts, I think five or six miles of that

2 extremely expensive project, because they could see

3 these fine cracks and they couldn't have any -- any

4 flaws at all. So okay. That's -- that's great.

5 Affidavit 10 addresses workers who could

6 testify that there was a -- either a 195 or a 250 --

I'm sorry -- 195 or 250 kilovolt or KV x-ray unit and describe how it looked and where and how often it was used. And I understand this was a portable unit. So , can -- can you all fill us in on the small portable source?

: Doc, the 250 KV was what I remembered it was in the old betatron. The control unit was on the desk on the side wall. And what I distinctly hated about this unit was there was no safeties on it, . It -- it was something we were very fearful of and had the incidents involved with people being exposed because there was no safeties on it.

: Tell me about that now. I'm an amateur. What -- when you say --

, Any time we would --

: -- no safety, what -- what kind of safety could it have been?

: For instance on the betatrons

we had key safeties, we had door interlock safeties. We had none of this on the KVP other than a key on machine itself.

: Okay.

: And what would happen any time we used a KVP and it was used for small metal --

: Uh-huh.

: -- we would have to be in the same shooting room as the betatron of course to set this up.

: Uh-huh.

: And on occasion if we were using the betatron, there was an incident one time of St. Louis Testing coming over, actually triggered the KVP while workmen were out in the betatron shooting room doing work. This person was authorized from St. Louis Testing of course to do that, but why in the world this person never checked with the operators. He just came in the door, walked over to the machine, triggered the machine while we had people in the shooting room. It was a bad setup. Now, the KVP machine was used only on rare occasions for specific small metal uses.

24 .: And was it used just in the

25 betatron building?

1 : Yes, sir, as to my knowledge.

2 : To both -- both buildings or

3 --

4 : The old building, sir.

5 .: The old betatron building?

6 : It was -- it was in the old

7 building.

8 .: All right. That's very

9 important. Anybody else remember that unit ever being

10 used anywhere else in the plant besides -- okay.

11 : That's the only place I can

12 remember it.

13 .: All right. That's good.

14 said that was the only place he could remember

15 it being used.

16 : Yeah. That was the one

17 where one of the workers walked out while it was still

18 going to -- he had taken a shot, and for some reason
19 there was no safety switch or nothing. And somehow he
20 walked out there and set up another shot while the
21 machine was still going. That was
22 : was that? was
23 that
24 : That was
25 , yeah.

1
2 : Yeah.
3 : Yes. That was
4 that was exposed on that. The 195 KVP machine was
5 used for thicknesses of like one inch or less.
6 Usually a weld prep on the -- on these castings that
7 -- that something else had to be welded to it and they
8 prepped it and used a -- probably used a -- I don't
9 know if they used an M film on that or a double A
10 film. I'm -- I'm -- can't quite --
11 : They -- They

used M film mostly.

: The letter designations indicate the speed of the film just like you would use a -- a 40 speed film in your camera right now or something like that. The A film was used for very small shots though, was it not?

: The A film, that was thick shots.

: I'm backwards then.

: It was real, real quick, you know.

: Yeah, quick shots.

: The double A was the one that was kind of -- the C film was kind of in between

the A and the -- well, the double A and -- and the M.

: And the M film was used for the -- for the longer thicker shots?

: Well, the thinner shots. The M, it was slower, and you could more resolution

with the M film.

: Okay.

: Okay.

: I know often we had three types of films in one --

: Right.

: -- in one shot to show the different aspects of the --

: Right.

: -- of the shot.

: Well, that's excellent. That's a lot of information we didn't -- I didn't know about at all before that. Which -- we've kind of touched on Affidavit No. 11. I think this is very important to just give NIOSH the -- the sense that there were incidents, accidents that occurred. So anybody who saw radiation overexposure accidents or incidents. And we've mentioned one involving and so forth.

So I have listed down here just some of

1 the ones that had remembered.
2 remembered an explosion. I had to be taken to
3 the hospital -- I didn't know about this
4 one -- replaced a donut tube in the betatron.
5 was ordered to get out of a radioactive area.
6 And -- that's -- was exposed to
7 the KVP source we were just talking about. And
8 recounts an incident with in the
9 betatron. So I'd like to open it up if anybody wants
10 to comment about any of those incidents or accidents
11 that could have let to overexposure or injuries.
12 And I think we -- we ought to talk -- I
13 know there were other kind of accidents in the steel
14 plant. But I think we ought to talk about the ones
15 that involved the radiation sources in particular.
16 , you want to start -- start us off?
17 : I doubled over from day shift
18 into second shift, and we were using the cobalt 60/80
19 curie. And we were doing fine. About -- it was into
20 the evening, around six, seven o'clock in the evening
21 we tried to retract the source, you know, after the

shot, after the exposure. And we thought we had it
retracted. The crank even slipped, you know, turned a
little bit. And then so I grabbed the survey meter
and I went out to check. And all of a sudden when I

got around the corner in the main shooting room the
MacBeth survey meter pegged. I got out of there in a
hurry. And so I tried to work the crank back and
forth. And by working the crank back and forth I was
able to break loose where it was hung up out into the
-- it was still putting out radiation. And so I
backed it out. And so I then went and we secured the
source. In fact, I think we took it for the rest of
the night out of commission although it was retracting
again and so forth. This was in approximately 1970,
and that equipment it was getting a little worn by
that time. And so they did call in the Budd people.
And they sent in Budd people, and they --

.: Let me stop you. Is that
Budd -- is that Budd Corporation, B-U-D-D?

: Yes.

: Okay.

: The same corporation.

: Okay.

: And so they did -- rebuilt, you know, so it wouldn't occur again. So that evening -- what they did, nobody knew -- knew what to do with you if you got exposed or nobody was sure. So my film badge was sent some place immediately. And you -- and that happened to be on a Thursday or Friday. And so

the guard was going to take me to Granite City Hospital, St. Elizabeth's but they didn't know what to do. So they took -- brought me home. And I come in and I went to Staunton Hospital. And we had doctors there, they were young and I think advanced. And although it may be a small hospital, they had an idea of what to do. And so they took a blood test and did all that. But nobody knew what to do. So I took a day off from work, and I think the doctor gave me

antibiotics or something. And so I didn't work in the betatron area for a few days.

: Let me ask you a question because I want to make sure we get this straight for the record. So you mentioned that the MacBeth survey meter was pegged.

: Yes.

: And so am I correct what that means is the -- the meter on it --

: That's right.

: -- went all the way over to the --

: Yeah.

: -- right and --

: Correct.

: And that's a maximum

exposure. And do you -- do you remember what the range on that meter was? In other words, what kind of exposure are we talking about?

: I -- I think it was six -- no.

It was a hundred millirem.

; A hundred millirem?

: Yeah.

: Okay. So presumably you got

that --that amount in --

: Uh-huh.

.: -- a very short time?

:: So as soon as they -- the film

badge information came back -- that's why I thought it

was sent to Landauer, you know -- they informed me

that I didn't receive that much. I was -- so they

kept me out of the betatron for a week or two then I

could go back into it.

, tell me this because I

think this is important. When you say they told you,

again, I'm trying to get at how the process worked in

the plant. Who would have informed you of that, your

foreman?

: Yes.

: Okay.

: My -- the department head.

A: The department head?

Q: Yeah.

A: Okay. Okay. But you never got a -- any documentation of it?

Q: No.

A: You never got a report?

Q: No. I had a -- they did send a paper to my home. Wasn't it to our home?

A: I think that you brought that from the hospital that night because they just brought you.

Q: Oh, the hospital. And they -- it did say I picked up so much. But -- and they also said I was only -- it was only equal to two minutes of radiation. So about ten years down the line cancer hit me, and we found out what from.

A: Let me ask you one other question. So I believe there was a -- is it (phonetic), was he the -- the dispensary person?

Q: Yes.

: Now, would -- would or somebody from the dispensary come? I mean, you were injured on the job?

: Yes.

: It was a medical problem.

: And the nurse send you -- send you with a guard to take you home.

: Okay. So --

: Yeah.

: So -- so somebody from the dispensary did come down and at least was aware of that?

: Yes. And in fact, I was brought home in the company station wagon.

: Now, was there a radiation safety person that was also concerned about that?

: Not too much. Not that I knew of.

: No. No. But I mean did they

15 get involved?

16 : No. Maybe next day they did.

17 : We got to be fair now.

18 : Yeah.

19 : Yeah. So next day?

20 : Yeah. Possibly.

21 : Did anybody from the plant

22 come and try and get details of what had happened or

23 anything?

24 : No. My own doctors had to do

25 it at the -- at the small hospital in Staunton.

1 : Okay. All right.

2 : And they were -- they'd just

3 be -- they were young doctors, highly intelligent and

4 they knew more than I thought.

5 : Okay. Well, I'd like to just

6 put on the record that, you know, here we've heard of

7 a rather dramatic incident. I've heard of many

8 incidents at other places that have been put into the

official record for NIOSH. And in all the time I've been dealing with this program for four years I have never heard a single incident that NIOSH considered to be an example of acute radiation exposure that would affect your dose reconstruction. I mean, it's incredible to me. It's often obviously very hard to reconstruct how much overexposure you actually got. You know you got a hundred millirems in a hurry, but the total amount, you know, so maybe over two minutes --

: Yeah.

: Well, it depends on how fast you got it. You know, if you were exposed to enough --

: Yeah.

: -- radiation from an atomic bomb, you could get a -- a lethal exposure in a few

seconds. So -- but anyway, it's important to get these incidents on the record in as much detail as you

just gave. And it -- what I think it shows is sort of the company's attitude about these kind of things. And so anyway I appreciate that -- that sharing a lot.

: This is - this is again. The thing is you don't find out the effects of it until ten years down the line.

: That's correct.

: You're already working for another firm in different industry and so forth like I was. I worked for -- in the aircraft industry. And I come home one night, and I -- for a couple days my doctor thought I was getting walking pneumonia or flu. And then I come home and got real -- I come home early. I never take off early just -- you just don't do that. And so I come home early, right, and then my family took me to the local hospital. The next morning they took biopsies, and they gave me -- gave me the news, they found it. They sent me immediately to Barnard Cancer Center at that time which is now Siteman. And they made all the tests there, and they says well, you have cancer of the pancreas and liver.

So immediately they decided to give me

25 experimental chemo. So for six months I took

1 experimental chemo, and I -- I beat it. I'm a
2 survivor. So that's it. And you don't find out. And
3 then down the line also if you ever have surgery --
4 like for example you have a heart attack or something,
5 they take blood tests and they find out they got to
6 change your blood. So I went to the doctor for a
7 checkup, a cardiologist. And I went to the bathroom
8 and I filled the stool. So immediately they sent me
9 to ICU and they started blood changing. And it took
10 how many days?
11 : I don't know, but it was like
12 eight.
13 : Like eight.
14 : , this was -- this was
15 when you developed cancer though? This was not --
16 : That's once it's already in
17 you.
18 : -- at the time this -- right.

Right. Right.

: Yeah. Oh, yeah. But you don't find it out --

: No. I know.

: -- when you get hit.

: That's a real valid point because it's all afterwards a little too late.

: Yeah. Ten years later.

: Well, I appreciate -- just bringing that back has to be an unpleasant memory, and we appreciate you sharing it because it tells a real story.

: That's all right. I'm just thankful that I'm here you to share it.

: Thank you.

, do -- do you want to put into the record the thing about the explosion event? Now, I know you've written that up pretty well, so we have that captured in writing from you.

But do you want to say a word about --

: -- just as an example?

: Yes. I would, An explosion if you've ever -- ever been around one of this size is something you never forget. I was a crew leader at the new betatron 25 MEV machine. The 25 MEV at the new betatron was unlike the old betatron. It had a selector switch on the capacitors. As explained as these machines especially in the case of firing extreme long shots would heat up. And it was common procedure to power the machine down, make a capacitor change. The heat would -- the heat

and the efficiency of the machine would increase with this capacitor change. We'd power the machine back up to running status again, and the machine would be running much more efficient. During the change, a capacitor change I was making during the duration of one of these long shots a loud explosion took place in

the mag room overhead. Now, it was big enough -- it was big enough to shake the dust off of -- off the whole ceiling. Preset procedure -- preset procedure was to immediately shut the machine down, climb the steps up to the mag room, shut the mags down, call supervision and electricians which was done immediately. I don't remember -- my crew was working, and this occurred during the latter part of my employment at General Steel. But I remember distinctly that the electrician called was He's a neighbor of mine and was called for a lot of duties at -- in the betatrons, a very fine electrician. Still is a neighbor of mine. I understand this gentleman changed a number of donut tubes on these betatrons. But he was called up --

: Explain for us what a donut tube is just for the record.

: Well, I'm not a physicist, . But to my explanation it's a vacuum tube --

: Okay.

: -- that's faster than the speed of light. The electrons whirled around --

: It's the electron source.

: -- and released --

: Right.

: -- through the cone creating x-rays --

: Right.

: -- as a brief description.

: Right. It's a source of the electrons.

: This man physically --

: Okay.

: -- changed these tubes.

: Okay.

: But the incident was dismissed simply as -- after inspection a dust explosion. It took a little while to examine the machine by the electricians. And they declared the operating status was okay, and we brought the machine back on line. But it was an incident I -- I will never forget.

, okay. Well, let me --

24 now you're talking again to an amateur.

25 : Uh-huh. I don't think you're

1 hardly an amateur,

2 .: No. No. No. I'm not really

3 using it that way. But -- so when you're talking

4 about the mag room, are we talking about a Magnaflux

5 room? I'm not sure.

6 : Magneto.

7 .: The magneto room.

8 :: It was a generator --

9 generators or mag head?

10 .: They were mag head.

11 .: So the power source, the

12 betatron.

13 : I remember the power source or

14 the betatron was overhead.

15 : And so that's -- that's where

16 the capacitors would be up in there?

17 : Yes, sir. The capacitor banks

were overhead.

: I've got you. And -- and so what do you -- what actually exploded?

: They -- they said on their -- on their opinion -- and opinion might be a strong word to use -- that as this capacitor change was being made --

: Right.

: -- changing over to another capacitor bank, that a dust -- a dust explosion -- excuse me -- occurred.

: Oh. Oh, so a -- an electrical discharge from the capacitor set off an explosion. And that happens in a lot of industries with a lot different kinds of dusts. So it ignited or it exploded?

: I would say it exploded.

: I heard a documentary recently on -- on fireworks and they were saying that

12 there was a -- quite a difference between a fast burn
13 and an explosion, a detonation. This was detonation?
14 : This was -- this was a loud
15 detonation.
16 : Okay.
17 : It was not a -- it was not a
18 slow burn or anything. It -- it was a loud detonation
19 to the extent dust blew off the ceiling.
20 : Well, let me ask you this
21 because, you know, you guys worked around it a lot.
22 How -- was that a once in a lifetime thing that you
23 all observed, or did that happen --
24 : For me, that's the only
25 time I ever saw it happen.

1 : And you're glad that's true,
2 right?
3 : We were -- we were schooled in
4 this sort of thing.
5 : Okay.

: We were -- we did have a set procedure to take the machine down.

: I hear you. Okay.

: This sort of thing never happened.

: All right.

: And we followed that procedure as exactly as we could.

: Okay. How about any of the other folks that worked in the betatron building? Did you all see any similar? That was it as far as you were --

: That was my experience with the explosion,

: What time was that was,

: I would say it was toward the latter end of my employment as a radiographer with General Steel.

: What year?

: I left there November of '66.
Some time close to that period. It was 40 years ago,

: Okay.

: I'm getting old.

: No. No. That's fantastic.

: Anything within good memory
is good for me.

, I hate to tell you but
we all are. I think we all are. So let -- let's go
to Affidavit No. 12 which is sort of related to
accidents, but now we're talking about workers who saw
betatron shortcuts. And you know, I'm just using
terms that people have described to me about rotating
the -- the head of the betatron to odd positions, you
know, for castings on the railroad car. Some people
have talked about flipping the betatron head 180
degrees or at an angle that would send radiation
possibly into Building 10. So I'd -- I'd be very
interested at this point if anybody wanted to expand
on that sort of occurrence that would -- that would

22 potentially expose more people to radiation.

23 . have you or anybody?

24 .: Well, the one comment that I

25 would like to make -- The comment I

1 would like to make is the -- the night I worked with

2 we shot the weld prep on a channel head

3 that was sitting on the railroad tracks in the

4 betatron -- in the new betatron with the cobalt 60

5 unit.

6 : Okay.

7 :: When that was -- the way it

8 was set up there was -- the radiation went straight

9 down the railroad track into 10 Building. And the --

10 that was the night that didn't lock the

11 case after the shot, and I crawled on him about

12 locking the case. And he did lock it then after I --

13 because of the safety factor. Anybody that was in the

14 control room that would have turned the crank the

15 source would have been out. The --

16 .: Now, were there people

17 working in the 10 Building that night?

18 : Yes.

19 .: Okay.

20 .: It was a normal working day.

21 : Okay. Got you. All right.

22 .: So the -- so the cobalt

23 radiation went straight down the railroad track

24 through the 10 door and up into the building.

25 .: Now, how long did that

1 situation exist would you say before it was, you know,

2 kind of recognized and fixed? I mean --

3 Well, we -- we --

4 .: -- did you complete the shot?

5 .: We completed the shot, and

6 then the -- it was like an hour long shot or something

7 like this. And you -- but it was -- you know, it --

8 it's one of those things that you don't forget --

9 : No.

.: -- because of -- of the excessive danger. And the -- the thing with the people in -- who worked in betatron a lot of us, you know, it became so routine that, you know, no big deal.

.: I understand.

.: So but like -- like you said 40 years later you find out how much you were really in danger and we was just doing a job.

.: So let me ask you this. I -- I can understand the geometry of a great big casting and being a problem about lifting it and putting it in the correct or the safest position. But what's your opinion of the particular event? Was it absolutely necessary to shoot it on the railroad car, or was it saving time, was it -- what's -- what's the --

: It was basically saving time. It was actually sitting on the floor. It was taken off the car and sat on the floor.

: Okay.

.: There was a Westinghouse casting set up in the normal shooting position.

.: Uh-huh.

: And there was probably other castings in the room, and it was the easiest place to set it.

: And am I correct that the -- the Westinghouse castings -- now, this is Westinghouse nuclear plant, like a part of the containment building that the reactor can -- or was it actually to -- to --

: There was a Westinghouse casting.

: Uh-huh.

.: Half a turbine, let's put it that way.

: A turbine casting. Okay.

: A turbine casting that was actually --

: Got you. All right.

.: They were set up on -- on timber or metal sawhorses where you could get

underneath them without crawling on your hands and knees and --

: Okay.

: And it was --

: So now, were those turbine castings -- I know you all did some huge castings. I mean, was it so big that it couldn't be handled in the normal way?

: Yes. It could have been handled in the normal way.

: Okay. I think has a comment to make.

: The --

: I think one of -- this is probably one of these incidents that -- incidents that I was talking about a while ago that this castings probably had to be brought in because there was remaining shot on it, had to see what the -- what that

shot looked like to finish that casting out. It was probably brought in, and in lieu of moving the other steam turbine out, bringing that one in and setting it up the one that we were working on remained in place, that one was brought in on the railcar, and the -- and

the rail car stayed right there, set up the shot and got it back out again.

.: Okay. It wasn't really just -- just convenience. It was to get a job done so we could get on with other work?

.: I'm assuming that.

.: Yeah. Okay.

.: This particular shot or shots was the entire weld prep on a channel head which was the nuclear top of a nuclear power plant.

.: Right. Right.

.: It was the final shot of the well prep that had to be clear before it was sent to Westinghouse to be put into operation.

15 .: I understand. Okay. Good.

16 All right.

17 .: I have a question. How could

18 you get a railroad car -- if you had a casting -- a

19 Westinghouse casting on the betatron car, how could

20 you get a railroad car in there too?

21 .: No. The castings were

22 brought in on the railcar and picked off.

23 .: That they -- they also -- you

24 also had a -- a car that you put the casting on too,

25 didn't you?

1 .: That was a transfer car.

2 We're not talking about the railcar. We're talking

3 about a transfer car that moved from --

4 .: Did you have more than one

5 transfer car?

6 .: Yeah.

7 .: There was one transfer car for

8 each.

: Okay. You said -- he said that they left the one in place.

: No. The one casting was left in place. The casting was brought in, picked off, set up on sawhorses in the shooting area.

: Oh, I knew you couldn't get two cars in there without leaving the door --

: As you all are talking remember that we're trying to get who's talking recorded.

: Okay. I'm sorry. This is . . These transfer cars --

: You're being shy so I'm not going. You're getting it okay? All right.

: These transfer -- these transfer cars were brought in from -- from 8, 9, and 10 Buildings, and there were two of them. One went

from 8 in to 9, and the other one picked up in 9 and went through 10 in to the betatron. So there had to

be a transfer made between those. But they were just transfer cars. had something to add to that also.

unfortunately too many of us operators were given direct orders to invert that camera completely. Before you invert that camera that -- that betatron camera has definite limits not allowing you to shoot toward the control room or the ribbon door. Upon orders of inverting that camera, turning it all the way over these limits would change allowing you to accomplish that. Supervision knew of this, they would give us direct orders to do so. Now, it was either our jobs or we inverted it.

: I understand.

: And that's -- too many of us experienced that. And when we experienced it we didn't like it.

: Right.

I want to tell you we had bad feelings about it.

: Right.

25 : We didn't like it at all.

1 : If I could just clarify one
2 thing or ask you guys to clarify it. is
3 talking about a betatron procedure and
4 talking about a cobalt procedure.
5 .: Right.
6 : So there's two procedures,
7 different radioactive material or sources aimed
8 towards 10 Building and the door on the track; is that
9 correct? So there's two different topics?
10 :: That -- that's very correct.
11 .: Right. And so -- so -- so
12 just -- just for the record then the betatrons are
13 sending x-rays that way, high -- very high energy, and
14 the cobalt sources are sending very high energy gamma
15 -- gamma rays in that same direction. So good point.
16 : Quick question. What
17 happened to that railroad car that all this is sitting
18 on? Did it leave the building? Did it --

: It was a transfer -- a transfer car.

: Transfer car, Well, they went around. They were taken out on -- on normal, routine rounds. Just as said they were taken out probably all through the -- all through the plant, different buildings --

: Okay.

: -- for -- for normal usage.

: So were they inside for the shooting, the work and then went out back into the plant?

: This is again. We're confusing the railcars that took the castings via rail to the old betatron and transfer cars that took them in to the new betatron. Okay. These were not the same type of cars. The transfer cars in the new betatron, the castings were loaded in either 8, 9, and 10 Building depending upon what work

was done on them.

: Okay.

: They were loaded on the transfer cars, and they had a lead with a control panel on it. And you walked alongside of it and moved that to the next building. Or in this case you had to make a transfer. It wouldn't go all the way from 8 Building to the betatron. You had to transfer it to from 8 to 9 Building onto the other car and then lead it into the betatron. It stayed on those cars, and sometimes were shot on the cars.

: So those were company owned cars that stayed there at that plant all the time?

: They were just transfer dollies, flatbeds.

: And were the -- were --were they electric cars?

: Yes.

: That -- so that -- that's the

way they were powered?

: That's electric car.

Yeah. There's a difference between that and the railcars that took the castings over to --

: I'm sorry. I said I'm glad that I cleared that up. It was very important to distinguish between both of them I think.

: Okay.

: The -- the other -- the other clarification is this transfer car that went into the betatron -- in the instance where the channel head was shot it was unloaded, set on the floor on top of the railroad tracks. The transfer car was taken back out of the building, out of the betatron. So you're -- okay. Say this -- this sheets of paper here is your transfer track. The channel head was unloaded here on the railroad track in this corner of the betatron, and the betatron sat over here. The cobalt unit sat on the outside of the casting. The controls went down

the track through the wall where you cranked the unit -- the pill in and out. Okay. When that casting is sitting in this corner in the betatron on the railroad tracks, transfer track -- the transfer tracks and right here is the door --

: Right.

: -- that is between the shooting room in 10 Building. There was absolutely no protection whatsoever.

: It's an open space, is that what you're saying?

: Yeah. And this -- this -- this door between the x-ray room and Number 10 Building is nothing more than an overhead metal door.

: Yeah. Okay. Got you.

: Thanks for clarifying that. That's very important.

: So this -- this 80 curie source is no play toy.

: No. No. We -- we are aware of that.

: So this is -- this is -- this is, you know, some of the important factors when --

24 when you're shooting the betatron it's over in this

25 area around the corner.

1 : Let me just wind up with this

2 final thing about the -- the betatron. I'm back now

3 to that putting the head in different positions that

4 -- that would lead to more exposure. How often was

5 that done? , I mean you mentioned that it --

6 : , I could not --

7 . Excuse me. I cannot give -- I don't think

8 anybody here could give you a specific number. I

9 could say this honestly with -- with all the sincerity

10 it was done too many times in my estimation.

11 : I'm just trying to get a

12 rough ballpark. Would you say it happened once a

13 month --

14 : It all depends.

15 : -- on average?

16 : It all depends. I would say

17 maybe once every two to three months,

18 .: Okay.

19 : And then that was too often.

20 : Okay. Right.

21 ': Any time -- any time they had

22 to speed up a casting change or a move --

23 .: Uh-huh.

24 ': -- to save time that's when

25 these orders were given to us.

1 .: Okay. Well, that's very

2 helpful though. That puts some kind of limits on it.

3 : I have one question -- one

4 question, sir.

5 .: Okay.

6 ': Why -- why at all was the

7 isotopes used in a betatron -- betatron shooting room

8 when in fact we had no concrete ceiling in that

9 shooting room of either betatrons? The concrete walls

10 only go up so high. In the case of a betatron you've

11 got set supposedly limits. What happens when you

release that isotope? What are we talking about limits there? How about safety over our heads where the concrete ends part of the ribbon door.

: Right.

: That's something we're going to ask the experts to help us figure out.

: I would like an answer there, sir.

: Well, I'll give you an answer. I mean, I don't have to ask any experts. I -- I would say that, you know, what we're doing this morning is building a record which is saying in very strong terms that the company safety procedures were not adequate and that, you know, some of the things

that were done for example what you're talking about right now three times a year, four times a year should have never been done at all from a safety point of view. We've heard numerous violations of standard practices, not locking a source, for instance the

cobalt source. That was -- you know, that was extremely dangerous to do that, and -- and there should have been severe sanctions for having done that. I mean, so you know, that's guess -- that's second guessing a lot of things. But I guess the answer is, , that that's why we are building this record.

: I'd like to say this, , not to interrupt.

: No.

: But all these fellows I worked with for a number of years I knew to be real fine operators --

: Absolutely.

: -- very qualified people. And I'll tell you what, safety was their utmost first thought.

: Don't get me wrong. I -- I think that, you know, throughout the nuclear weapons and nuclear weapon contractor sites we've heard this

over and over and over that well-intentioned, well-meaning people, great big companies with even greater resources than General Steel which had considerable resources -- that this kind of thing went on all over the place. And so you know, I really don't have an ultimate answer for you. I think my own opinion is that it's got to do with regulations and enforcement of regulations and licensing and inspections and -- and requirements and severe penalties honestly if people don't adhere to them. So --

, 40 years after the fact, 40 years guys like us are sitting here reading manuals we never saw 40 years ago and scratching our heads.

: Absolutely.

: Scratching our heads --

: And I'm certain --

: -- wondering how long we're going live.

: I know. Well, just so you'll

know I -- I think we need to move ahead.

: Okay.

: But my -- my -- no. My

comment is that that's the very reason why I'm doing

what we're doing this morning. And I know that

getting this on the record is -- is the best way to

help you guys. So I'd say let -- let's move ahead and

keep on doing that.

: , you got a quick

comment?

: Yeah. I

-- I just wanted to clarify something that was asked a

while ago. I don't think we had a radiation exposure

safety man at the plant at all. I don't think there

was anybody with that designation. If there was, I

never heard of him. I just don't think that there was

anybody in that capacity was in charge of

the NDT lab, the nondestructive testing lab, and I --

and he may have been. But if so, we never heard of

anybody who was a safety -- a safety person in the plant at all.

: Let me just make a follow-up comment to that because I think -- I think , I think maybe - one of the two said that they did give some kind of -- , you can help me on this.

: Health physics --

: A health physics --

: -- three day class. But it

was strictly for -- the ones we've seen recognized were for isotope specialists, period. I don't think they did it for the betatron workers.

: Right.

: I mean, I know they didn't do it for the betatron workers.

: But just for -- just for the record then I think we -- we -- this would be good to get on the record then, that -- that those people in

particular, I mean, , even

: Yep. That -- that as far as your betatron people were concerned they didn't come in and act in the capacity of radiation safety officers. Is that a fair statement? All right. And I -- just for the record I'm seeing nodding assent from . So I -- I -- I think we can establish that point this morning.

: I just want to make one comment. When I go to a hospital now into the x-ray room and witness hospital employees, x-ray technicians without their badges on I chew ass because from what I've learned here I'm passing along.

: Yeah.

: And it's surprising how many x-rays technicians in hospitals do not wear their dosimeter badges.

: Point well taken.

: Yes. Yes indeed. Okay. Oh, good. Well, it's definitely time to stop and have lunch then. That -- that's great. Yes. We can quit. So it's about one. That's perfect.

(Whereupon, a short lunch recess was taken.)

: Okay. We are reconvening after lunch. And I just wanted to say for our record that all of us here want to express our really sincere thank you and gratitude for SimmonsCooper and all that they've done for us. And I just think we all feel that it's above and beyond what we could have ever expected. So thank you very much.

I want to do something different. So we've got a bunch of things to go over. And what I want to do is to put the affidavit topics on the record and then open up the floor and kind of go around the table. And -- and if you all will sort of pay attention to topics that you might comment on, then this last part we're going to have is a much more free association kind of thing where you can -- you

can speak to a particular topic that -- that you have particular input about.

So Affidavit 13 was related to the transport of the ingots and the castings on railroad cars throughout the different building. And I think we've been over that -- that one pretty well.

Affidavit 14 we have not talked about yet. That's very important, and that has to do with people who either operated or can describe the Magnaflux operations and the plant locations where the Magnaflux was used. And I should mention that wrote up a very nice overall description of the process of the Magnaflux operation. And just to sort of peak you all's interest in this a little bit more one of the things we realized in understanding that process is that that powder, the Magnaflux powder that was on the castings that went into the betatron that was then radiated and taken back out into the plant, that probably that powder, that fine dust like material was also activated by the betatron and itself was -- was

radioactive to some degree after that point. And so maybe that -- that will focus on why the Magnaflux really was sort of important as a vehicle to carry activated radiation products throughout the plant.

Affidavit 15 we've talked about -- a

little bit about the getting rid of the records, the records that were burned or discarded and to what extent this was done. And then we have a series of affidavits that relate to things that we don't believe were really in operation at the plant to any significant degree.

So Affidavit No. 16 testimony there was no regular radiation safety training except for the metallurgists. I think we've talked about that again. Testimony that there were no bioassay samples such as urine or feces, we haven't talked with that. But in general bioassay samples are used to assess the amount of uranium that's -- or thorium, but more particularly uranium that accumulates in the body.

So uranium enters through the -- through the airway, gets into the lungs, then is transported through the blood and binds to bone in particular. It's slowly released from bone and eventually gets in the urine or in the fecal stream, the insoluble uranium. So in particular urine uranium measurements are a pretty good measure of total body uranium burden. And NIOSH pays attention to that. I don't think there's any evidence from what I've heard that that was done at GSI.

Affidavit No. 18 has to do with testimony

that there was no regular breath zone or area sampling for radioactivity. And again, breath zone and area sampling is done in places where there's a lot of radioactivity, where there's a lot of dust, and where -- so -- so the -- the dusty -- there's a dusty environment. And -- and that is a -- is a separate source of radioactivity. Now, I really believe from what I've heard about the plant operations that that

should have been done. But we need some testimony about whether you all are aware if it actually was done or it was not done.

We certainly believe from pictures and everything that you all have told us that in general except for gloves occasionally and so forth that there was no radiation protective gear that you wore. So anybody who could make a statement about that would be useful. So there are certain things that -- like this that we need to have evidence even if it was negative that there -- there was -- none of this was done. We -- Affidavit --

, you got a minute?

: Yeah.

: My name's

: Yeah.

: Testing, they did do one

type of testing on all of us.

: Okay.

: That was a white blood cell. And I personally failed a white count one time. And they pulled us off the job until we could pass our white blood count. This happened to numerous people there.

: Do you remember --

: I don't know of any --

: Do you remember about over what period of time they tested your blood?

: How often they tested?

: No. Just what years that testing went on.

: Oh, God. I -- I'm going to say I failed my test probably 1966, maybe '67.

: Okay. So the --

: I remember I was in the new betatron when they told me. I was getting ready to go onto the second shift as an x-ray technician crew leader because that's what I did my -- mainly, just mainly betatron. And they come in there and they pulled me off the job and put me in Magnaflux. And they told me what they -- they'd pay me betatron rates

25 and put me in Magnaflux because I failed my white

1 blood cell test.

2 : And did they tell you what

3 that meant? In other words, why you failed it?

4 : My understanding what it was

5 was my white count was too low.

6 : Uh-huh. And did they say

7 why?

8 : No explanation whatsoever.

9 : And how about -- how about

10 you, how did you feel about it?

11 : I thought nothing of it. In

12 fact, it upset me because --

13 : Yeah.

14 : -- Magnaflux was a much

15 harder, dirtier job.

16 : Right.

17 : And I was upset over that.

18 : Now, did they say how low

your white cell count went?

: No. They didn't tell you

nothing.

: Okay.

: All they did is said you

failed the white count test. I think there was at

that particular day one of these guys if I can

remember his name -- he's dead now. was his

name.

COURT REPORTER:

He also failed

the white count.

:

.

: Uh-huh. Okay.

: He also failed a white count

test because I remember him going out to the betatron

with me. Me and him worked together quite a bit.

: Okay. Well, what I want

everybody to think about -- yes. I've heard that story, and that's extremely important because unless they were doing it for some other reason that I'm not aware of, the most direct relationship of course is between acute radiation poisoning. And you know, one of the primary manifestations of that is a rapidly dropping white cell count. Now, what that implies to me if that was being done and that was the reason, you know, that ordinarily you would have expected there would have been a -- an explanation to you all that that's why they were doing blood sampling. So anyway, that's extremely important to get on the record.

I think somebody told me however that

maybe that was like in the early -- or during the '50s and the early '60s. I don't know, but -- but it stopped at some point. Is that --

No. Because I worked there from '63 to '70.

: Okay. You weren't even

there.

: So I -- I'm sure --

: It was later then.

: I'm sure it was in the mid '60s.

: Okay. All right.

: And I know of all these guys here every one of them took that test.

: Okay.

: Blood -- blood tests,

: They would come in and -- unannounced, say that you had to go to the lab, to the dispensary --

: Okay.

: -- and they would make you take a white count test.

: All right.

: And that's all you did. They took a blood sample, then you went back to work.

: Okay. And just for the record when you had your low count did you get a -- any kind of report that said how low it was or --

: Nothing. All I know is what was my foreman.

: Say that name again so that we can have it.

:

:

: Well anyway, was my foreman --

: Okay.

: -- and he was a real nice guy. And he told me -- he says , you can't go back on the job, you failed your white count.

: Let me -- let me ask you if this is a fair statement. It sounds to me in all of these interactions that you had with people from the dispensary and the isotope people that primarily it wasn't a direct interaction, it was really through your foreman and supervisors. Is that basically true?

: Everything was done through

24 our foremans (phonetic).

25 .: Okay. All right.

1 i: We had no relationship with

2 anybody other than our shift foreman --

3 .: Okay.

4 :: -- unless there was a

5 problem with you, then the big wigs took over.

6 .: Well, the blood cell counts

7 -- and you know, after we get through if someone wants

8 to comment more. But I think that's -- that's very

9 important because what it indicates to me is that they

10 were perfectly aware that there was a danger. And

11 specifically, you know, white cell count depression

12 really comes after a large cumulative dose of

13 radiation and generally quite -- rather quickly. So

14 that -- that's of utmost importance.

15

16 . yeah.

17 : Yeah. I think the only

reason they gave certain people a -- the white blood count test was because when they read the film badge it was a little bit high, the dosage was a little high.

: Okay.

: Everybody didn't get it.

: That could be true.

: Because I never had one.

: You never had a blood test?

: Never had one.

: That's interesting.

: I think it's the ones that the people that when they read the film badges they had a little high radiation.

: Well, while you're thinking after this meeting -- let me just say this. You know, that -- that's also -- I mean, what you just said is also extremely important because for instance the -- the readings on test, his radiation

12 cumulative dose per year was below the acceptable or
13 permissible limits that year. So if there were people
14 who were getting higher than permissible exposures and
15 -- and you still were not really told that directly,
16 you were just told that you had a low blood count,
17 then that -- that's additional rather damning
18 evidence, I mean, that -- that something was going on
19 and you all really were not being informed.
20
21 : Yeah.
22 . I do
23 remember that worked in the -- in the lab
24 --
25 : Yeah.

1 : -- predominantly the biggest
2 part of the time. He probably wasn't around x-ray or
3 betatron too much --
4 : Yeah.
5 : -- other than what his duties

6 took him there.

7 .: Correct. Okay.

8 ': I do remember that we were not

9 given regular blood tests. I remember when I first

10 started in the betatron they might have given us a

11 blood test every three months or so --

12 .: Okay.

13 ': -- or right around there. And

14 then it seemed toward the latter end of my employment

15 they just dropped it all together. I -- I don't

16 remember taking blood tests in the latter part of my

17 employment. I left there November, '66.

18 .: Okay.

19 : But I don't think it was on

20 any -- any regular basis as . . said.

21 .: Okay. But that's why we need

22 input from multiple people because people's

23 experiences may have been different. That's fine.

24 Okay.

25 Affidavit 20, we have heard that certain

people were aware in -- in Plant 10 for instance that -- that x-rays came through the betatron building. Well, let's just say through the new betatron building either through the ribbon door or through the railroad track opening and so forth. So anybody who has knowledge of that. And now we're particularly focusing on people outside of the betatron building who were aware that there was an x-ray problem within the inner plant. Now, we've already talked about the operation down in Building 6.

But specifically there were people who said that -- that worked in Building 10 and that were aware when the betatron was on. There were some people who said there was a red light that came on. But anyway, that they would leave their place of employment and go to other parts of the building. And I -- I -- I think we need some testimony on that if you know anything about that.

And kind of related to that is one of the facts that we -- that's really quite crucial that we don't know about is how the control rooms in the old

and new betatron buildings were actually shielded and in particular, you know, if they used lead and what -- what was the thickness of the lead. So in other words, were -- were the -- were the control rooms that

you all were inside and -- and assumed were fully protected from the betatron and from the gamma sources, the cobalt 60, were you really fully protected? So anybody who has intimate knowledge of that, that would be extremely useful.

: Yeah.

: We had an episode.

was a safety man, he was also an isotope operator was ordered to come into the new betatron for a shooting session of cobalt, the big source shooting a casting. I assisted him in setting up the shot, vacated the area when he was ready. The betatron was locked out of course. fired off his shot. We were in the control room. The outside entrance door

to the control room is locked. I, the assistant -- my assistant anc was in the control room. At that time came in with a Geiger counter, was taking Geiger counter readings and stated at that time -- stated at that time that he was picking up contamination. Now, the only way that could happen --

: Now, , let me stop you. Inside the control room you're -- we're talking about?

: Inside of the control room,

: Okay.

: Very clearly inside the control room.

: Okay.

: We were -- we were inside the control room as the shot was taking place.

: Okay.

: Probably six months ago

and I had dinner with who told us --
and I about fell through the floor. I hate to relate
this, I don't like relating this. But he said he took
his film badge off when he saw that there was
contamination in the control room and walked outside
the control room. Now, that was the first time I
heard of this in 40 years. At that time I don't
specifically think I knew there was contamination at
that time. But this was -- this incident was related
over dinner to and myself, sir.

: Okay.

: Now, I think it's
self-explanatory I sure didn't like to hear that. But
the only way I can figure out that possibly isotope
radiation could enter the control room through all
that concrete and sand was the concrete only went up

approximately halfway. Over the top of that was steel
siding. The roof was nothing more than a steel roof.
Over our heads in the control room was the mechanical

equipment room with a concrete floor. That radiation had to go over our heads through that steel siding down through the floor and into the control room. That's the only thing I can figure out. They called it ground -- ground shine, sky shine. We -- we called it scatter in those days.

: Right.

: But it was reported by to , and myself this -- this incident taking place at that time. I was present in the control room with at that time but had no idea at that -- that possible time there was contamination there. But he stated to us that he left the control room, took his film badge off because of the contamination in the control room. I don't understand his reasoning, but that's what was said.

: All right. Well, let me -- let me ask you a related question then which is what we've touch on before about routine monitoring. I mean, so he was inside with a Geiger counter. Were -- was there other -- were survey -- and you all said that there were with survey meters. But what I'm not

getting a very clear picture about is were the survey meters actually used. In other words, were they on and clicking in the control room at all times so that you --

: No, sir. Not ever to my knowledge. No. What was done --

: In other words --

: -- they might --

: -- why -- why would he be in there surveying for contamination, or do you think maybe there was some specific reason?

: Sir, the only thing I know he went out of the control room into the office into the cabinet where that was stored --

: Okay.

: -- got a Geiger counter out of there and came back in the control room.

: Okay.

: On rare occasion they would come to one of us operators and have us take readings

21 outside the betatrons, either the old or the new as
22 shots were taking place --
23 .: Okay.
24 : -- to help monitor. That's
25 the only either a survey meter or Geiger counter use I

1 saw at that time of any kind of readings taken.
2 : Okay.
3 : I don't know of any kind of
4 special air readings or whatever taken or --
5 .: But -- but -- but just to be
6 clear there were no routine survey meter readings
7 taken within the control room?
8 : This was on -- this was at
9 random, sir.
10 .: Okay.
11 : At random best explanation.
12 : Okay. That's fine. That's
13 great. All right.
14

15 .: Yes.

16 again.

17 .: All right.

18 : I think r had

19 a job, he was in -- a safety man for the department.

20 By that I mean he acted as a go-between. He didn't

21 work for the company at that time. He worked for the

22 department I guess as a safety man. And as some of

23 his duties he went around and made various checks.

24 And I think he used to come in about perhaps once a

25 month, check with a Geiger counter to find out if

1 there was any radiation exposure out there and make a

2 report.

3 : So -- so I do need to

4 understand that. When you say he did not work for the

5 department -- I mean, he didn't work for the company,

6 he worked for the department, which department?

7 . : The nondestructive

8 testing department.

: I understand that. But was that -- that not part of GSI?

.: Well, yeah.

.: Okay.

.: I mean -- I mean, he was not a company --

.: He was not -- he was not a betatron --

.: He was a betatron operator. He was not a salaried company individual.

: Oh.

.: Okay.

: He was on the seniority list.

.: He was on the seniority list.

.: Okay. Got you.

: And he was designated

inner department safety manager.

: Okay. Now, you -- you made a

distinction earlier. We said that -- I can't remember who made this comment, but that it was fair to say that there was no radiation safety officer. Now, when you say a safety officer, that sounds like you're describing a radiation safety function.

.: That's true. There was a radiation safety function.

.: Okay. But -- but you don't want to -- I mean, I'm -- I'm not trying to put words in your mouth. I'm just trying to figure out that -- why wasn't for example just the radiation safety person at GSI?

.: I suppose you could call him that. I -- I don't know who he reported to even at that particular time.

: Oh, I understand. Did he give you all any training per se?

: No.

: Okay.

.: No. He -- he ran around looking at things to make sure things were safe and --

: Okay.

25 .: -- as part of it -- as

1 part of his duties he did take Geiger counter readings
2 --
3 .: Okay.
4 .: -- in and around the
5 betatron.
6 .: Yeah. A -- a monitoring
7 function is what I said.
8 : Right. Exactly.
9 .: Did he look at other things
10 besides radiation safety? Because you had a safety
11 committee at the plant. Did he look at other safety
12 issues like the -- is the electrical stuff safety or
13 safe for --
14 : No.
15 .: I'm -- I'm not sure.
16 : -- safety issues? Just
17 curious.
18 .: Okay. Well, I think that's

very -- that that's very useful. Affidavit 21 has to do with something that we -- we need to pin down and that is I know has said in the past and many people I've talk to have said that in general the betatrons -- both betatrons ran at full maximum power. But the other thing is I want to pin down -- I -- I don't get a sense that the betatrons were calibrated

either at all or regularly. And I -- I want -- I want to hear from you folks is that accurate or -- or not. And then -- and then let me sort of counter that by saying that on the other hand I've heard in the past that there were occasional inspections of the betatron facilities. And I'm not talking about what we just described by , but perhaps by the Atomic Energy Commission. But they were done no more frequently than once or twice a year. So is there anybody who could speak to that right now? How about the betatron calibration? were -- were those machine calibrated? In other words --

: I don't -- I don't think so.

: Okay.

: I don't they were calibrated.

: All right.

: I think they just -- the only time that I think that they were calibrated is when they worked on them when something went wrong.

: Well, were -- I mean, were you all aware -- calibrated them I know that. Didn't he? Did

: The electricians came in

periodically and calibrated them.

: Did they?

: Yeah.

: So I -- I'm not -- I'm not sure we captured that correctly. So are we saying that there -- that there were periodic calibrations

maybe?

: Well, I'm not for sure. I

-- I saw very little calibration.

: You should -- you should say

what you're aware of personally.

: They ran it at full speed.

I mean, top notch all the time.

: So --

: If they'd walk in and catch

you running it down kind of low or down medium, you

were in trouble. You had to have it cranked up.

: You were expected to run it

wide open all the time?

: Yeah. Right.

: Wide open all the time,

: I'm with you.

: It was --

: Why was it wide open all

the time?

: It was faster, you'd get it done faster.

: Right. Okay. And can anybody speak about those periodic inspections? Now, I guess the way I've heard it described is somebody came in once or twice a year, they put the betatron heads in particular positions, they made some measurements. It sounded like there was very little feedback. Can anybody confirm that or speak? why don't you and then . why don't you all --

: From my --

: Now, have you got your mike on, because I think this is a real important point?

: I'd like to make one little comment on Affidavit 20.

: Okay.

: In my opinion is not a competent person.

: Okay.

: You don't know when he's telling you the truth and when he's not --

24 .: Okay.

25 .: -- end of story. Affidavit

1 21, I think Westinghouse came in like once a year and
2 so -- and did check the machine if it was running
3 properly.
4 .: Westinghouse?
5 : Yes.
6 .: Okay. Good.
7 .: Which wouldn't take very long
8 because they would just point the machine at the wall
9 and crank her up and see if everything was functioning
10 correctly.
11 .: Okay.
12 .: Other than that when the
13 machine would get too hot, say we were shooting long
14 shots all day long, there was a switch on -- on the
15 control panel where you switched banks. When it got
16 too hot for both switches or both banks then they
17 would come in and -- the electricians would come in

and add or subtract electricity in the control -- the control panel upstairs.

.: Okay.

.: But everything was run at full strength.

.: Okay. Fair enough.

.: If it was a short shot, long shot, whatever, it was full strength.

.: And kind of along these lines now --

:

.: Yeah. I'm sorry.

.: I do remember -- I do remember, and I'm sure it was the Atomic Energy coming in there on the day shift when I was an operator in the new betatron they had us -- me and my assistant guy -- not doing any exposures other than rotating the betatron head in different directions, aim it towards the shooting room, away

from the shooting room to the -- it would be the south side, then towards the railroad tracks, but all within the limits of where it was supposed to be.

: Okay.

: And they would go around the building.

: Uh-huh.

: Then shortly thereafter I remember them putting more lead in the shooting room where the electric was upstairs. And I know I remember that.

: That's in the wall in the mechanical equipment room over the shooting room.

: Right.

: Just what I was talking about with that source.

: Upstairs?

: Upstairs.

: Upstairs. Up above our

heads.

: The wall of the mechanical

equipment room.

: It's where all the

electricity was.

: All right.

: The shooting room was just a

panel, like a computer desk.

: Uh-huh.

: Okay. It was a little

larger.

: Uh-huh.

: But upstairs was where all

the power was.

: Okay. Well, that's

interesting. So do you remember was the control room

itself kind of encased in lead, or was it just the --

: See, I --

: -- concrete and sand?

: -- just assumed it was okay.

Okay.

: All I could see was cement blocks --

: Okay.

: -- in the ceiling.

: Got you.

: Just like I'm in this room right now --

: Okay.

: -- I assumed it was okay. The doorway was a steel door, the same thing I got at my house --

: Okay.

: -- that we went in and out of.

So -- no. That's very helpful then. So -- so we've got Westinghouse making some inspections, the Atomic Energy Commission.

: I'm not sure.

: But maybe.

: I think.

That's fine.

: Nobody ever showed me nothing.

.: No. No. That's fine. But

well, could it -- maybe we need to ask it this way. Could it have been Westinghouse that was doing those inspections?

: I would see no reason for them to.

: Okay.

: They cared less.

.: Well, I mean one of the things that --

: I assumed it was something to do with safety.

.: Okay. The betatrons were built by Allis Chalmers, and Allis Chalmers was a very interesting company.

: There was too much took

place. Before these guys came in they would shut the place down and sweep and clean.

: Oh, okay. Okay.

: Everything had to look just so.

: Okay.

: Okay?

: Yeah.

: So you knew somebody important was coming in there.

Okay.

: But other than that they didn't care.

: Okay. Got you.

: And then when these guys come in they're wearing suits and ties and the big wigs are kissing their butts and --

: Okay. It was a big deal?

: It was a big deal.

: All right. Yes,

: The calibrating, I do periodically remember them coming in and the electricians I think doing the calibrating.

: Yeah. Let me get your microphone hooked up. Okay. Go ahead.

: But I do remember the electricians coming in and shutting -- and calibrating them. That's what I thought they were doing.

: Calibrating the output of the machine or the --

: Right. The output of the machine.

: See, the whole problem is none of us knew what they were doing.

: We were never told what was

going on.

: Let me ask -- ask while he's there how frequently would you --

I couldn't honestly say. I just remember them coming in sometimes and doing them.

: Some time. Okay. Good. That's -- that's useful.

again. We could tell -- we could tell if the machine was getting out of calibration or slowing down so to speak. If -- if the amount of roentgens didn't click off in the -- in the prescribed time that it should have been, there was a meter on the control panel that you set your roentgens. If you were going to shoot a thousand roentgens, you set it to a thousand.

: Right.

: It clicked off each 10, 15, 20. I can't even remember. But it would click off, and at the end of that shooting time the shot was over.

: Okay.

: There was no time allotted to it other than the fact that we knew it should click every so many seconds or --

: Right.

.: -- milliseconds or whatever. And if a thousand roentgen shot supposedly took an hour and a half to do it, if it took and hour and 45 minutes and it was running at full power like it should have been, then this thing needed calibrated --

: That makes sense.

: -- calibrating. And we would call in the electricians and say calibrate that. Or on Saturday morning it's going to be down for maintenance, it needs to be calibrated. And was one of the main -- the main people who did this. And he did a lot of the calibrating on that machine.

: Okay.

.: But I remember that would call him and say get down here and calibrate that machine. was from Pennsylvania and had a distinct accent, and we all made fun of him. But he calibrated that machine quite a bit.

: Okay.

COURT REPORTER: Those two names you said?

was one of

the names.

: He was an electrician.

: The other name ,

foreman, betatron foreman.

: Yeah.

: You said he was from

Pennsylvania. Was he from the sister plant?

: Eddystone.

: Eddystone.

: He came in from the

Eddystone plant. He was a superintendent following --

following or was (phonetic)?

: He was under .

: He was under

15 : But did come in?
16 : Yeah. came in when
17 got kicked out. Yeah.
18 : All right.
19 : Okay. Well, that -- that --
20 that's excellent. That's good. This one -- this is
21 one I think I can get some response for. NIOSH always
22 assumes that everybody worked eight-hour shifts. So
23 Affidavit 22, workers who can certify that betatron
24 people often worked longer that eight-hour shifts. Is
25 there anybody who could comment about that?

1 : All of us I'm sure.
2 : Why don't we have two
3 representatives to represent the group on this.
4 Eight-hour shifts were the norm, were they?
5 : Eight-hour shifts were --
6 were not the norm.
7 : Not the norm?
8 : Not the norm. Very often

people would work 16 hours. You went by seniority, by a overtime list. And the person on the -- on the shift with the least number of overtime hours was asked first for overtime for the next shift. One time we passed on down through four shifts, and a man was asked to work overtime. And he worked -- he worked days, he worked afternoons, he worked midnights, then he worked his day shift again. And the -- and then --

: Wow. That's worse than doctors.

: And the health people got so --

: Who was that?

(phonetic).

: I think he worked 32 hours straight.

: That's what I -- I worked 32

hours one time.

: I saw a contract book last week that showed in 1972 the radiographers signed a contract for three dollars and 84 cents an hour beginning in 1972. If you look back into 1966, we were probably making somewhere around three dollars an hour. General Steel plant in Granite City, they couldn't issue a payroll check for more than $500.

: Yeah. I remember that.

: If it went over $500, they had to give you a second check. Got paid over two weeks. At three dollars an hour, two weeks was $240. The aim of all the guys in the department was to work enough overtime to make that guy issue him two checks. So $240 and make $260 in overtime to get $500 plus.

: Yeah.

: Even if it was 24 cents they had to give you $500 and -- and another check for $24, whatever.

: I got for one check for $500, and then I got another check for three cents. Matter

25 of fact, I still got the check.

: And I was making a whole
lot of money at that time. I was making $635 a month
as a -- as a foreman in the department. That is --
that comes up to about three dollars and 80 cents an
hour or something.
: Working every Saturday and
Sunday.
: Okay. yeah.
. I normally
worked three eight-hour shifts overtime each week --
: Wow.
-- plus Saturday or Sunday if
it came up.
: Okay.
: But overtime was just a normal
thing. I mean, you could work -- you could work as
much as you wanted to work.
: Well, let -- let me -- let me

make a comment for the record then. Why this is important is that you know when you calculate radiation dose it's the intensity basically times the time. So the number of roentgens or rems you get per hour times the time of that exposure equals your -- times the time equals your exposure. So NIOSH says that in doing your dose reconstructions they make

routinely what they call claimant favorable assumptions.

So a claimant favorable assumption specifically for handling uranium is that a worker is exposed to it eight hours a day which is where this what they assume is the normal workday comes in, you know, eight hours a day one meter away from the surface and so forth. And they say that's very claimant favorable. Well, it is if -- except that as you're saying now many people worked way more than 40 hours a week. So that could underestimate your dose by, you know, maybe a factor of two. That's the way

it sounds. I mean, we just heard the description of somebody who worked as much overtime as regular time.

So anyway, there is very -- I mean, it may -- I want you to all to believe that the things we're asking are highly relevant to getting this claim, you know, decided in -- in your favor as it should be. And so that's really -- that's great testimony.

: Yeah.

I seem to remember that they had to give you the 14th day off. If you worked 13 days in a row, come 14 the state of Illinois was going get vicious and your wife was going

to put you out the door if you didn't come home, believe me.

: Yeah.

: There was -- there was some fellows there with some marital problems.

: The --

.: You want to put that in for the record?

: Please.

.: Yeah. Okay.

.: Okay.

: The other thing is in -- when you worked overtime you may be working in the betatron. And in my case I could have been working in -- in layout or Magnaflux.

.: Okay.

: So you're -- you basically were not away from the dust and the radiated dust.

: Right.

: So there was other factors that you could include in this radiation dose.

.: Right. We definitely will include all of those, every one that you can document for us.

: So the --

.: We'll include those.

: -- the overtime was so sporadic that in fact put in -- put out a notice one time if -- if you thought you weren't getting enough overtime, come see me.

: Okay. Good. Well, I -- I think that's -- that's -- that's great. I -- I wish -- for Affidavit 23 we need some testimony as to the very long x-ray exposures of some huge castings. And can you all put some kind of definition on that? I mean, I know some of the big castings had 400 shots and so forth. But give us an idea of some of those great big castings, how long the total exposure; in other words, the aggregate of all the shots would be. Anybody that could tell us about that?

I seem to remember anything 18 to 20 inches thick would -- would run at least two hours or roughly around two hours. That would be a 10,000 roentgen shot, We had numerous 10,000 roentgen shots depending on the casting we were shooting.

.: Okay.

: If that's a help I don't know.

you --

: Am I wrong on that,

-- put in your two --

I think he -- I think he was a little bit low on that.

: Could be.

I think a 10 R shot probably took four and a half hours to shoot.

: Was it that long,

: Yeah. Yeah.

: Could be.

: Four and a half hours.

: It took that long?

Four and a half hours to shoot -- to shoot a 10,000 roentgen shot --

: We'd save that for the night shift.

: Yeah. What some of the

them liked to do was shoot that at the end of the -- and the end of the shift and then forget to put it on their charts so the next guy coming in could get to shoot it again, you know, because that was four and a half hours they could --

: Okay.

: -- sit there and watch.

At any rate I think -- I think it took two, maybe two

and a half hours to run off 5,000 roentgens if I'm not mistaken.

: Yeah. That sounds about right.

: And 40 years ago -- man, I haven't thought about that in 40 years.

: I haven't either.

: But I'm certain -- I certain that a 10,000 roentgens shot would take about four and a half hours. And we had -- we had some 11,000 roentgens.

: Didn't the roentgen counter only go up to 5,000, , and then we had to shoot the 10,000 --

: Six thousand.

: -- in two shots? Is that right?

: I can't -- I can't remember that. I think you could probably know more about that than I would. But --

: Just so I'm -- just so I'm clear though, the 10,000 roentgens or the 11,000, that would be for the total number of exposures; is that right?

: One shot.

: That's one shot.

: Just one shot?

: Yeah.

: One shot.

: One shot,

: And that would be for castings that were 20 -- some of them ran as thick as 24 inches on the -- on the large sizes.

: But you know, I've seen -- I've seen pictures of the big castings and they'd have a grid on there and each grid would be the size of a piece of x-ray film.

: Right.

: So I -- what I'm trying to get at is would each of those exposures be 10,000 R?

: No.

: The cumulative?

: No. Probably two, maybe three or four of those shots on that entire casting would be that thick, and the rest of them would be somewhat smaller.

: I see what you mean.

: Depended on the thickness of the steel.

: Sure. That makes sense.

: If you -- if you look an English walnut and broke it evenly in half and looked on the inside of that and you saw the little leaders and -- and the holes in --

: Sure. No. I understand.

: A steam turbine for Westinghouse reminded me of an English walnut.

: Okay.

: It was -- it was shaped like it and it looked like it.

: So you adjusted the exposure for the thickness of the steam --

: For the thickness of the casting.

: All right. All right.

: Okay. On -- on the --

: That's fine.

: On the inside of a casting you also had the --

: Get your mike on, please before you start.

: On the inside of the casting when you -- when you put the turbine inside the machine, inside the casting when it was in the power plant you had to have bearings for this turbine to be

able to run and rotate without wobbling or -- or whatever.

: Right.

: Okay. Your -- your bearings then on the inside of the casting were -- like I said were your thick portions. They would be -- may only be six inches wide, but they may be 12, 14 inches thick.

: I got you. All right.

: Okay. You had to shoot those separate from the shell, let's put it that way. The shell would probably be two, three, four inches thick. So that's where you got your variation in your shots. Well, naturally everybody shot the thick shots first.

: Right.

: And when the machine got too hot you -- you switched the capacitors. And when they got too hot you called the electrician to add or subtract capacitors.

: So let's say -- let's say your biggest, thickest casting and you had to shoot multiple shots, how long would a total casting take to -- to shoot I mean start to end?

: Sometimes a week.

: Okay.

: Two -- sometimes two weeks.

: Okay.

COURT REPORTER: I didn't anybody.

: He said up to two weeks.

: I'm sorry.

: So one --

: Yeah.

: One big casting, one big

10 total casting up to two weeks. Is that a fair

11 statement? That's amazing. Okay.

12 .: And then -- then you need to

13 realize that --

14 : Wow.

15 .: -- whenever or whatever

16 defects were in that casting from the first shot had

17 to be -- come back in and reshot.

18 : Right. I understand.

19 : Okay. And then it was

20 continually reshot every time there was a repair made.

21 .: Right.

22 : And so some castings may --

23 may have went in four, or five, six times --

24 .: Wow. Okay.

25 : -- until they were clear.

reshot. Okay.

: Wow.

. With -- with Navy work, atomic submarine work on Magnaflux, on outside surface work everything one-eighth of an inch or above had to be taken out. One-eighth of an inch was Navy specifications. I'm not even talking about subsurface, that had to come out too. To give you an idea everything that went into nuclear sub preparation.

: Yeah. Yeah. That's great. again.

, I just did some rapid figuring here and a casting that had 500 areas or 500 shots on it -- and I took an average of 20 shots a shift, would that be fair?

: Yeah.

: Twenty shots a shift would take 45 shifts, three shifts a day, 15 days. So some of them were two and -- two weeks and longer inside.

1 .: But -- but each -- each
2 exposure of that could be 10,000 Rs is what you're
3 saying. So the total --
4 .: No. No. Only about four
5 or five. Only four or five of those shots would be
6 that -- that length.
7 .: Well, let -- no. Here's what
8 I'm trying to -- what I'm trying to do is some mental
9 calculation if you did -- I'm not pinning it down to
10 -- I mean, let's say that the average exposure for the
11 thinner parts was 3,000 R. But you -- you'd still --
12 would it be even less than that? One thousand R.
13 Okay. So -- but I mean, to get a total dose delivered
14 to that piece of metal you'd have to sum of all of
15 those individual exposures. That's what I'm --
16 : Master shooting log, is
17 the only thing that could tell you complete exposure.
18 .: And then somebody at the end
19 would add that up. Okay.
20 .: Well, I think if -- if

you had 500 shots and the average was 1,000, that's --
that's a half a million Rs right there.
: There you go. Okay.
: Plus your -- plus your
tens and 11s and --

: That's terrific. That --
that's what I'm trying to get.
: That was the first
go-round.
: Okay.
: Then went out and had to
be repaired, they come back in to get shot again.
If the shots didn't turn out,
you had to reshot them again.
: Oh, yeah. And -- and the
reshot.
: A lot of the long shots were
reshot.
: So we're talk about 500,000

15 to several million --

16 : Before it was all over

17 with, absolutely.

18 : -- total roentgens delivered

19 to that casting.

20 : Does that give NIOSH a better

21 idea?

22 : It should. It should. It'll

23 -- it'll give Mr. -- if you think you could make that

24 calculation in a few seconds, we give Mr. Neaton

25 (phonetic) something to work on for about a year. I

1 don't think they'll be able to make those

2 calculations, but we'll see.

3 : Some of those long shots never

4 turned and we had to reshoot them too.

5 : Right. I understand. No. I

6 think this -- that's -- that's rich.

7 : They were very happy to --

8 : Exactly.

: I remember looking at -- again -- looking at that film and they would -- it would be in there just a little bit crooked and the camera wouldn't be set up head on and it would blow it, blow the image off. Maybe you could see it and maybe you could pick out the defect and maybe you couldn't. And more than often you'd have to say retake this one, move your camera over here to get -- get a head-on. And there are some angles on there that we just couldn't shoot if you remember on some of those castings. You couldn't get them. You couldn't get it.

: Okay. Good. And just --

: And just one more remark,

: Yeah. Go ahead.

: We had -- we had two betatrons going 24/7.

: That's important.

: Two betatrons going 24/7.

3 .: That's important absolutely.
4 Affidavit 24 has to do -- I'm not sure we have --
5 might comment on this. But the -- the isotope
6 -- testimony about the radioactive isotope used by the
7 metallurgical lab, and we're trying to get now about
8 AEC licensing. And what I -- what -- what this is
9 really getting at is who was licensed by the Atomic
10 Energy Commission. And I'm presuming it was the
11 people who were licensed to use cobalt 60 and iridium
12 192. So anybody who can address that kind of thing.
13 But the betatrons weren't really licensed by AEC,
14 right? So does anybody know about AEC licenses there
15 at GSI?), yeah.
16 : It is customary that the
17 company has the license under CF 21, isn't it, or
18 191021 or something like that.
19 : I'll look at that up, but I'm
20 not --
21 : Yeah. But I --
22 .: Code of federal regulation is
23 what he's talking about.
24): It's been too many years. And

25 you were under the license of the company.

1 : Correct. I -- I understand
2 that.
3 : And it's not only a practice
4 at General Steel, other companies.
5 : Everywhere.
6 : Yeah.
7 : But -- but isn't it true that
8 -- like at Washington U there are thousands -- a
9 thousand laboratories that use some kind of trace
10 amounts of radioactive isotopes. But each individual
11 investigator who uses that material also has to have
12 some training. Now --
13 : Oh, yes.
14 : -- yeah -- and film badges
15 and all that kind of stuff.
16 : Sure.
17 : Okay. So I guess what I'm
18 getting at is who would be the people -- is it the

people that we call the isotope people that would be -- be trained to handle those isotopic sources? You all have mentioned them several --

: The AEC. We were trained by the Atomic Energy Commission.

: Okay. All right.

: Yes. And they --

: And did it -- did that occur at the beginning of your employment, or was it something they did every --

: At the --

: -- every year?

: After I was -- first they have you working with the betatron.

: Okay.

: Or you first get hired in at the lab, then you come into the betatron. And after you're comfortable on -- in the betatron, Magnaflux, and everything well, they put you -- they have a

13 class --

14 : Okay.

15 : -- on the Federal Register.

16 : Uh-huh.

17 : And it's a lengthy -- it's a

18 couple days of lengthy class. And then you are then

19 -- if you passed, you were under -- the company would

20 be licensed to --

21 : I understand.

22 : -- allow you to run the

23 isotopes.

24 : Now, would

25 or somebody like that administer that training?

1 Yes.

2 : Okay.

3

4 was?

5 : Yeah.

6 : Okay. Good.

: He's the one that --

.: Okay.

: And also there was another one, , but --

: Okay. I know he -- his name is kind of charged. But okay. So -- so there were people who were authorized by the company to give that kind of training --

: That's right.

.: -- to the new people that handled the isotopes.

: That's right.

: Okay. Well, that --

: You personally did not hold a license.

.: No. I understand that. That's -- that's right.

: The operator --

.: That's exactly the

information I was after. That's great.

: Uh-huh. Thank you.

.: Now, this is one that I think we just need a few people. Actually, acknowledgement around the room would be helpful here. So Affidavit 25 says testimony workers were never adequately informed about the risks from alpha, beta, gamma, neutrons, or x-rays from the betatrons, the cobalt 60 sources, the -- what I think now is the 195 KVP x-ray units, or the iridium 192 gamma sources. And I think as many people who would want to acknowledge that would be very useful at this point. So I'll just open up the floor about that and just were not told about the risk.

. The -- I don't think we were really adequately told what the hazards really were. The one thing I do remember distinctly was on the cobalt unit, the 80 curie source cobalt unit a lethal dose was three minutes. You did not die tomorrow, you died six months later after you suffered a little bit. But all in all I don't think any of us really realized the danger we worked in. It was a good paying job and we appreciated our job.

: Sure.

: And we tried to do a good job

as best, you know, each individual could.

: Right.

: So the -- so when -- when this organization finally came together is when we're really starting to find out what dangers we really lived in.

: That's useful. And then one of the things I did not put on there, but I -- I really should. The other main thing that, you know, NIOSH and The Department of Laborer are concerned about is the uranium ingots. And I gather from what everybody's told that -- that really not any specific instructions were given to you all about the uranium dangers specifically. Is that a fair statement --

: Yes. I --

: -- from your point of view?

: Yes. It would be a fair

18 statement. The same way when -- when we worked on the
19 Westinghouse channel heads, the nuclear submarine
20 torpedo tubes it was just another casting, another
21 piece of metal.
22 : Right. Okay. That's useful.
23 Well, maybe we could just go around and have people
24 say that they either agree or if you need to add
25 something to it. But I think it would be useful to

1 have as many people are here affirm that that's --
2 that's a fair summary of the situation.
3 .: The reason were when I found
4 out that the lethal dose on the cobalt 80 or 60 source
5 was three minutes that's when I really became
6 concerned.
7 .: Now, was that told to you
8 while you were employed there?
9 : Yes.
10 : Okay. That's -- that's good.
11 ! That, you know, there were --

12 .: I mean, it's not a good fact,
13 but it's good that you were told.
14 :: Well, the thing is it -- you
15 know, it's -- it's like a hearsay thing that passed
16 among the guys that --
17 : Okay. Well, let me --
18 .: -- it made you think.
19 : Well, let's -- let's pin that
20 down though. That's what I'm really getting at. Did
21 -- was that word of mouth, or did somebody explicitly
22 come to you with a piece of paper and said ', you
23 need to understand this, that what you're handling
24 there is lethal within three minutes?
25 It was strictly word of mouth,

1 nothing was on paper.
2 .: Okay.
3 : The same way
4 (phonetic) did a lot of the work in 6 Building.
5 .: Okay.

: And he -- what I always remember he always carried that Geiger counter with him --

: Uh-huh.

: -- which tells you if you think about it there is -- there's a reason why you carry this little tool.

: Yes. There is. Right.

: So you know, people might not tell you why he's carrying it --

: Okay. That's --

: He knows why.

: Absolutely. Okay.

: So you have to put two and two together and find out it's four.

: That's excellent.

: And then we'll get -- we'll get you next then.

: As far as any knowledge

that we had of what actually was going to happen to you we didn't really have. I was told when I went to working there that you don't want to get in front of that camera, that radiation out of there is like shooting darts through your body. You know, it will destroy the tissues and your white blood cells, your teeth will fall out, your hair will fall out, and things of that nature, you get fat like I am. But we weren't told.

: When was I exposed that's what I want to know.

.: We weren't told the effects of radiation.

: Right.

.: We just weren't told. We -- we were told it's dangerous, don't get -- don't get in front of it. We were told as soon as the camera was off -- as soon as the controls went off it was okay to walk out there, there was nothing floating around. I remember being in 10 Building a lot because I took care of the Magnaflux out there. And there was

22 one man out there who was a chipper or a grinder, and
23 every time the red light would go on he would turn
24 tail and run from the 10 Building. And I used to kid
25 him. I'd said where you going. And he'd say I'm

1 getting out of the way. And I said that's down there
2 in the betatron, you don't have to worry about that.
3 He said no, no. He said that stuff leaks through the
4 walls, it can get through that door, it can come right
5 out here. He said that light goes on I'm going down
6 to the other end of the building. I can't remember
7 his name. I think it was something. But I
8 used to tease him all the time, you know.
9 : Now, you should have made
10 your radiation safety operator.
11 .: Absolutely. He was the
12 only one that knew what was going on.
13 : He was looking for a job
14 there. Yeah.
15 .: To add -- to add one comment

to that. One of the ironworkers, if he knew he was going to work in the betatron the next day, he was scheduled to work in the betatron the next day, he would call off. He would not come to work. That's how afraid he was of that building.

.: Okay. That's interesting. That's very useful, very useful.

. I can say with a hundred percent honesty if the actual -- actual hazards we just simply weren't told. If they did

know, they simply did not tell us. Forty years later people, we're reading your Los Alamos handbooks, your DOE handbooks and we're seeing these very things we should have known 40 years ago. And that's when we started asking question. But I can say with all honesty we knew too little in those days and were told as little as possible. That's -- that's a pretty fair, honest statement. Thank you.

.: That's great.

10 : I was never ever

11 told anything. I knew -- I just figured it was a good

12 job, good paying job and I wasn't scared of it.

13 : That's fair. : has a

14 comment.

15 : On this here adequately

16 informing you, you were never adequately informed. A

17 few of us got to read the -- that Federal Register.

18 : Okay.

19 : And what was in the Federal

20 Register we knew which was not sufficient. You know,

21 the Federal Register is a broad scope.

22 : Right.

23 : All the Federal Registers are.

24 And -- but any good DOE handbooks or anything else,

25 where are they?

: Let's -- let's -- what -- what would be good standard practice these days would be, in addition to the fact that certainly you shouldn't get in front of a camera beam directly, you know, people would say that according to modern science any dose of radiation increases your risk for developing cancer --

: Uh-huh.

: -- that radiation induced cancers generally have a long latent period which can be anywhere from a couple of years to 30 or 40 years so that your risk extends over your lifetime. It sounds like that sort of information was not conveyed to anybody in any way at all.

--

, when they told -- when they said the betatron was off there was no residuals, I don't know if activation was a term in those days.

: It was. It was known.

We were -- we were told there was no such thing as activation or residual.

: Activation was known as -- as

early as the early 1950s when some of you all began working at GSI. So that was an established physical well -- actually a very well-known principle. But I was quite surprised -- and I have done a lot of reading and a lot of research. And you know, the betatron was invented in 1939 by Donald Karst, and he -- he became real interested in that in his graduate students right away.

And so in the early '50s there were people -- I read one study of a chemistry professor who wanted to demonstrate to his students how -- how the elements in the periodic table were different. And so he got a sample of many, many of the elements on the periodic table, and he irradiated them in a betatron machine and induced activation. And then what you can do is you can put those activated compounds in a spectrometer and read the -- the irradiation spectrum. And you can infer from the peaks what the element really is. So he actually had -- he used betatron activation to reconstruct a periodic table by his

students. And so it's a powerful effect.

And it -- and the reason I tell that story

is it affects basically every element. I think it

probably affects every element. So -- every atomic

species. And so all this was -- you know, it's --

it's better understood now. But it was certainly

understood as a physical principle actually before the

1950s. But by the -- by the early 1950s well

established scientific fact.

, how do you think some of

us feel? And I know everything you say -- you are

saying is fact.

: Yeah.

: Forty years later some of us

have come down with cancer or we've got so many

ailments we don't feel like talking about it. And not

only that, there's a possibility we might have hurt

other workers out there in the plant --

: Right.

: -- specifically because we're not accurately informed of the dangers in what we were handling.

.: Well, I'm going to answer it in a personal way as a physician. I mean, my -- my job was to heal people. And my profession -- you know, we -- we discovered early on that radiation could help cure cancer. But at the same time what we also learned is that radiation has a lot of side effects and complications. And -- and I am quite sad that my profession in general as the years have gone

by would -- would like the public to believe that radiation therapy and diagnostic radiology has no risk at all which is simply not true.

And so the facts, the actual facts, you know, if you can read in the literature are extremely well documented, have been documented since the early '50s. So it's a parallel situation. You guys weren't being picked on selectively if that means anything. I

mean, we -- the people -- you know, nondestructive testing is very useful and absolutely essential in steel making, no question about that.

Radiation therapy is absolutely essential in modern medicine. There's no question about that. But in general the people who are invested in -- in doing that do not tell the people who are using the technology the true risks. And that's another reason why I'm sitting in this room today. You know, that's -- it's my little way of making up for something that I feel quite badly about from my own profession which is supposed to be healing people.

You all were supposed to be taking x-rays of things and making good products, and you were. But it's all part of the same story. And it's -- I really don't know what to say about it other than that. But anyway, I think this -- this testimony is quite

make a comment on -- on just what you said. My next older brother died of cancer at John Hopkins University Hospital I guess it's been 35 years ago. I was in the hospital outside his room when he died. One of the doctors at John Hopkins, after he was pronounced dead, he was standing in the hall crying and all he could say is we lost another one. I'm about in tears now. But it, as you said, radiation is a useful tool in its own categories.

: Right.

: And I'll never forget that day when you see a doctor cry, we lost another one.

: Yeah. Well, I think the intentions are good but the implementation, taking care of the people who are usinge the technology is -- the record is -- I'll admit it's better. But if you look back over the last 75 years it's a pretty sad story.

So all right. Well, let's see. Let me wake -- wake up Betsy here and see what we can do. Okay. We've just got a few more. We've mentioned today and I think we've covered this pretty well that

25 some of the work done in nondestructive testing at GSI

1 was -- was done through St. Louis Testing Corporation.
2 And we've learned that some of that was done outside.
3 And so if anybody has any more comments about St.
4 Louis Testing and what their relationship was with GSI
5 -- in other words, I guess what -- what I think would
6 be useful is were they doing work, kind of spill over
7 work that GSI was just too busy to -- I mean, I know
8 machines operated all day long and all night long. So
9 were they doing spill over work, or were they doing
10 something special in that outside testing that was
11 different from the normal work that was being done
12 there? Is there anybody who could talk about that
13 or --
14 I do
15 remember seeing St. Louis Testing working on castings
16 sitting in the field between the new betatron and the
17 old betatron with sources out in the open. Now, I
18 couldn't say whether it was spill over work. Normally

we had authority, the -- the people like ourselves in the betatrons and Magnaflux had authority over that type of work.

.: Okay.

: If it was spillover or special work, I couldn't say, sir. But I saw these people out in the open air with -- with sources performing actual

work.

: Okay. Good. Thank you.

again.

, I think if you understand about union contracts and so forth we -- we contracted with St. Louis Testing to come over and do work that we not -- not couldn't perform but didn't have the time to perform.

.: That's what I meant by spill over work.

.: The only time that we could outsource any job like that is if we had full

employment in our plant. Okay. If we got down to the point where our workers didn't have anything to do, St. Louis Testing would not have been in -- inside those gates.

: That's what I meant by my term which was poorly used. But that -- that's what I'm getting at.

: I would -- I would think it was --

: This was extra work that you couldn't handle in a timely manner?

: It was extra. I would almost be certain of that.

: Okay. Very good. All right. That's probably sufficient. Let's see. mentioned about some work done with American Steel, nondestructive testing American Steel with a linear accelerator. And I think somebody mentioned that it was a 1 MEV device. Can you fill us in on that,

knows that.

: I worked with over there. was a senior operator, I was an assistant. And as I recall I think it was a one million volt linear I think. It's been again 40 years ago. But we worked over there on -- on specific castings from GSI that was subcontracted at -- at American Steel. But was the -- one of the main operators there.

: Well, that's good. , tell us what -- what --

: Yes. It was a 1 MEV.

: But what was your impression of why -- why were you doing it when you had 24 or 25 at --

: Well, you had --

: -- at GSI, why -- why go to American Steel?

: You have -- it was the overflow of work.

: Good. Okay.

: They had 6 Building, they were working in there x-raying.

: Okay.

: And they had both betatrons going.

: Again, you just needed extra --

: Right.

: -- capacity and they were there?

: And just needed extra capacity and they just didn't have it.

: And remind us again how -- about how frequently would you use that service?

: Every day.

: Every day?

: Every day, you know, yeah.

: Wow. For -- can --

: We used it --

: Can you put a time period on

24 that?

25 : Well, we used every evening.

1 We started or we used it on the evening shift --

2 : Okay.

3 : -- and the midnight shift

4 because they used it on the day -- they only used it

5 on the day shift.

6 : Oh, okay. And -- and can you

7 give us some idea of the years for that?

8 : Oh, I'd say -- I'd say --

9 say from about '64. Was it about '64, , that we

10 started going over there?

11 : Probably about that time.

12 : Yeah. '64 through '69 I

13 know.

14 : That's terrific. That's

15 great.

16 : Probably '64 to about

17 that time.

: Okay. All right. Well, that clarifies that. We're almost there, guys.

Affidavit No. 28, workers who can describe procedures if flaws were found in products after radiography exams, how and where were corrections made, how were products transported from testing sites, what personnel were involved, was there retesting after corrections were made. Let me just

comment. I think we've -- we've -- you've certainly clarified for me that castings had to be done, if flaws were found they had to be repaired, then they had to be reshot in the betatrons or with the gamma sources, they went back out to the plants, and so forth. So I think I understand all of that.

What I -- what I need us to all work on for -- for after this meeting is -- what we're really looking for here is we certainly believe now for certainty that activation was a real phenomenon. So what I've asked to do and -- and maybe we could

all work together to get this done. What I would like to have is a list of the buildings, you know 6, 7, 8, 9, 10, and the betatron buildings, we know that. But a list of basically what was done in those buildings and what jobs were -- were concentrated in those buildings.

Now, I understand that there's going to be a lot of overlap. But when we define the special exposure cohort what I want to do is to include comprehensively all the people and all the job descriptions that came into contact with those castings. So what I would envision is a list, Building 6, Building 7, 8, 9, 10 and within each building what kind of work was done there. Like in

Building 6 the railroad trucks, you know, four and six-wheeled trucks. And 7, 8, 9, and 10 you all can fill that in better than me. I -- I'm not sure where the --

: Seven -- 7 was sand reclaim I

believe, wasn't it?

: Well, we -- we need to do that systematically, . I need you to do one of your master documents here. We need a document. And then within those buildings which -- you know, if every job was represented in every building, well that's probably not going to help. But -- but we need a list of the job descriptions because we want to include all the people in this -- in this class who were exposed. And basically what we were saying anybody who was -- who in any way interacted with those castings or the uranium ingots, the inspectors, the guards, the electricians, all those folks I think we've got abundant, rich testimony that they were all at -- at risk for being exposed. So --

: Yeah.

: In 9 Building and 10 Building alone -- 9 Building was mostly Navy, Westinghouse. 10 Building was a lot of Army tank hull, turrets.

: Right. I've heard that.

: Both these buildings, welding, welders, burners, chippers, grinders, inspectors.

: Okay.

: All these people were directly involved. If you could imagine while Magnaflux alone was taking place on any -- any one or -- one or a number of castings as far as you can see in these buildings.

: I understand.

: If I could visualize hot sparks flying every direction, burning into your neck, burning into your arms.

: I do.

: A burner gets on a -- on a casting and washes defects out of a hot casting, sparks flying every direction, molten metal. Chippers, a lot -- noise so loud when it hit a casting with a chipping hammer, debris flying from the chipping hammer everywhere.

: Right.

: This was constantly taking place in both 9 and 10. 8 Building if I remember right was mostly a machine building.

: Okay.

. 7 Building was sand reclaim.

.: Okay.

·: If you opened the door, of Number 7 Building when sand reclaiming was going on, you couldn't see the other side of it.

.: That's terrific.

·: It was that bad.

: That's great. So --

·: 6 Building was railroad underframe --

.: Right.

·: -- side trucks, various railroad work as such. Magnaflux went on there on occasion and -- and isotope work in -- in that Number 6 Building, block building.

16 .: Well, see that -- and I think
17 if we take that framework and add in the contract
18 books for a couple of years to just name the job
19 categories, we're going to pretty much have that
20 pinned down. ', do you have some more to add to it?
21 .: Just to follow up what
22 was talking about. At the end of -- of 10
23 Building on the east end of 10 Building they did the
24 painting of the underframes I think, on that whole --
25 that whole end of that room was painting or

1 undercoating and whatever they put on it. And down in
2 8 Building on the east end of it is where they
3 machined those railroad rings down there in that pit
4 where they -- the ring went around, the tool went
5 around and machined that big ring.
6 ': Yeah.
7 .: You all have mentioned it.
8 What is a railroad ring? I don't know.
9 : Iron -- Iron -- iron crusher

ring.

: Oh.

: They were --

: They were 30 foot in diameter.

: -- big around as this

room was. Yeah.

: Okay.

: And they'd -- I think

they used them -- some were in the roundhouses to turn

locomotives around.

: Well, I know the -- I know

the round -- is that what we're talking about? Yeah.

The -- the platform that would rotate --

: Right.

: -- so it could get it going

the right direction. Yeah. Okay.

: These rings were probably

--

: Well, they were gigantic.

: -- that tall --

: Yeah. Okay.

: -- and that thick. And they were machined so that they would turn.

: That's fine. That's terrific.

: 8 -- 8 Building also was an inspection building, face plate.

: Yeah.

: Down on the west end.

: Right.

: Down on the west end also you had the foundry. You also had the -- the heat treat. The heat treat was off of 10 Building between the betatron and the foundry where all your castings were heat treated, where they'd --

: How about rotoblast charger?

: Well, okay. And you had the -- the rotoblast which would clean -- clean the scale off of the -- off of the equipment so it could be Magnafluxed or -- or x-rayed. I mean, you got to -- you got to get that scale off so you can get down to

1 the metal. So there's --

2 .: No. That's an excellent

3 picture. Now, I think we can take that and weld that

4 into just the kind of description that I was talking

5 about.

6 .: Then -- then you figure in all

7 the crane operators --

8 : Yeah. Got to remember them.

9 : -- that were -- were in each

10 one of them buildings riding up and down, going from

11 one end to the other. Back then I -- I smoked and if

12 you dropped a cigarette on the floor, you didn't bend

13 over to even pick it up. It was that filthy dirty.

14 : All right. Okay.

15 has a question.

16 This is

17 Were -- were you guys eating

18 and smoking out there around radioactive particles?

19 Just take it from there.

20 :: Regularly.

: So you're sucking in more particles and breathing it, eating?

: So -- so question was were you eating in these dusty areas. And there was -- everybody was nodding assent that in

fact yes, they were.

: Yes. When they -- when you --

: You couldn't get away from it probably, could you? I mean, there wasn't -- there wasn't a clean place to go probably.

: The --

: On a day-to-day basis.

: Yeah.

: When it came lunch time you sat down on your casting or you found a -- a welder's stool or whatever and you ate lunch right there on the job.

: How about a bundle of asbestos?

15 .: Okay. I worked the hot floor
16 a lot.
17 .: Asbestos is another day.
18 : This is
19 , are you listening?
20 has got something.
21 : Yeah.
22 ;, yeah.
23 .: When they was cleaning
24 General Steel up in '93 getting that all trash and
25 everything cleaned up out of there I was working at

1 SCI. Well, right out from the pits where -- where
2 they was digging that scrap metal with that
3 contaminated metal they had to go out there in that
4 dump and dig that scrap metal out of there. Well, we
5 was sitting right on the other side of that fence
6 eating our lunch.
7 .: Okay.
8 : General Steel or --

: Good point.

: -- Granite City Steel had to

-- blocked where nobody could get in there while they was digging that metal out.

: What year?

: '93.

, you're saying you were at Dow while they were cleaning up GSI during the -- the actual cleanup?

: Yeah. It was actually SCI at that time. Yeah. They was digging that dump out out there, digging that metal -- that contaminated metal out of the dump out there.

: Now what year -- what year was that?

: '93.

: That's right. That's

correct. I just came across that report. I actually wrote that company, ERG, Environmental Restoration

Group. So I --

: Granite City Steel had guards out there that had it blocked where nobody could get in there.

: Okay. I'm trying to get that report from those folks. So okay. So we got -- we got two more. Let's see if we can get through these.

: I want to make one comment.

: Go ahead.

: On 8, 9, and 10 Building in the summer time they would also have these four-foot square roll around fans going to keep cool or whatever you would call it. So think about how much dust they were blowing around.

: They were blowing it. Yeah.

: And the -- some of the chippers and grinders would wrap themselves in bags and cloth to keep their clothes dirty -- I mean clean. Talking about asbestos, I worked the hot floor a lot. You had asbestos -- rolled asbestos thrown over these castings to help maintain heat.

: Yeah.

25 : And people throwed them around

1 like they was cloth.

2 : Right.

3 : And you got to shaking it, and

4 it naturally fell apart right in your hands. And you

5 know, unbelievable conditions that we hear about or

6 think about today --

7 : Yeah.

8 : -- that we worked in and

9 thought nothing of it.

10 : Yeah. No. That paints a

11 very rich picture for sure.

12 : When they -- when they poured

13 these Westinghouse most of the time it would be at

14 night. And there would be so much smoke in them

15 buildings that you could put your hand in front of you

16 and couldn't even see it. And we'd pour them at night

17 so the people in the city didn't know what was going

18 on, two or three o'clock in the mornings. I'd have to

go in and help pour the heats.

.: All right. Affidavit 29 gets at which classes of people -- and we're thinking about custodial people, electricians, inspectors -- who were not betatron operators or assistants but who regularly came in and out of the betatron buildings. And I guess, you know, so there's some of the categories.

But like . for instance was an inspector, and I understand the inspectors were certainly in and out of the betatron building. The electricians another group for sure. Are there any other groups that we're missing because --

: I worked -- I worked -- I worked in 12 Building. That's where we made them big industrial castings. And they -- they would pour them, and sometimes we'd have to go over in the betatron and look at them when they was x-raying them for cracks. Then they would have to inspect them and all that. Me and -- I called him

all the time. , is her father.

: Yes.

: Me and him was good buddies.

: Okay.

: Me and him would go over there and there'd be two or three other foremans.

: Okay. Got you.

: We'd go over there and look at the castings.

: All right.

: That was about every two weeks or so.

: So -- so wouldn't it be fair

to say that potentially anybody who had a casting --

: We was all over the plant, all over.

: -- in any part of the plant would -- might on occasion go into the betatron building? So --

: That's what I said. We'd go in there to inspect them castings and the --

: Yeah.

: -- hair on your arm you could feel it, the radiation and we would laugh about it.

: So would -- would it be fair for us to say then that there was a traffic in -- in and out of those buildings by various people and it -- it could -- well, it certainly would include guards. Anyway, if you all have more, I think I can write that up pretty well. I -- I don't know that we need a -- a long -- a much longer detailed list than making that general statement.

: They had these big overall exhaust fans that would run in there a lot, so they was sucking the air from -- dust from everywhere.

: Well, since -- since you brought that up let me ask you what -- what would you say were the -- were they great exhaust fans? I mean,

did -- it sounds like it was a fair -- somewhat dusty environment or --

: They-- they -- they used them mostly when they poured these big heats for the smoke, to get the smoke out of there.

.: The smoke.

: Because they had a stuff they called high heat that they would put on these -- in this after it was poured to hold the heat in there so that metal would settle down, wouldn't be cracks in it.

.: Uh-huh.

.: And then they'd, like I said, take these asbestos cloths to cover that up and hold the heat in there.

.: I've seen that today. I mean, we saw some of those trains going down the tracks in Granite City and they had asbestos blankets around the top.

Yes.

: Okay.

: This sand system, all this sand that come from all different building was

24 recycled. It all come right back out from all over

25 the plant.

1 Well -- well, let -- well,

2 now you actually did a great segue into Affidavit No.

3 30 which is this talking about radioactive sand. And

4 I'm not -- you all have mentioned sand and I

5 understand how that's used in the casting process.

6 But was there --

7 They took these molds after

8 they got the casting out of them --

9 : Right.

10 : -- out of what they call a

11 shake out.

12 : Okay.

13 : But you'd put them in there

14 and they'd bounce it and shake all that sand back out

15 of it.

16 : Okay.

17 : Then it went back to the sand

18 system and they recycled it and they'd come back again
19 to reuse again.
20 : So I understand that all that
21 sand possibly could have gotten activated. But was
22 there any kind of sand that people talked about that
23 was radioactive per se when it came into the plant?
24 : No. I don't know anything.
25 : Has anybody heard --

1 where did that term come from?
2 Actually, it was
3
4 : Okay.
5 : And I thought it was a
6 zirconium or something sand that was slightly
7 radioactive. And when he was relaying the story about
8 the source being taken home by a laborer in 6 Building
9 there was actually concern that it was ground up
10 because when they went around with the survey meters
11 they were actually finding radiation everywhere in the

12 plant.

13 : Yeah. Yeah. That's what

14 happened.

15 : And it was because of a low

16 radioactive sand --

17 : Yeah. That's --

18 : -- that was used at a plant

19 for a particular reason.

20 : Okay.

21 : So that's another source of

22 radiation that was there before it ever got activated.

23 : That's that's true.

24 : It came in radioactive

25 apparently.

1 : Okay.

2 was a

3 metallurgist so he's probably pretty accurate on that.

4

5 : Yes, sir.

6 : I'd like to mention people
7 like l from the maintenance department
8 that would come in, change oil on the betatrons, both
9 betatrons, also all fluids on the crane, betatron
10 crane. All fluids would be changed by these people
11 and handled. We'd find out there's quite a question
12 to contamination to these fluids and grease.
13 .: Good point. Well folks, I --
14 I want to personally say that I think this has been
15 just fantastic beyond what I certainly imagined. And
16 I want to thank you all for hanging in there. And to
17 the court reporters and to the videographers, this was
18 more than you bargained for. Just remember this, it
19 all gets easier after today. But we really appreciate
20 your staying, and we really thank you for staying with
21 us. And for -- for everybody here this will help a
22 lot of people at Dow and GSI because these general
23 conditions I'm sure pertain over there as well as.
24 And it will probably help a lot of people who have
25 claims in on this program. So I -- I couldn't

appreciate it more. And we -- we will then be in touch with you. Again, if you have any comments to send us -- now do you know are they set up -- are we going to try to collect the handouts and copy them or give them back or how are we --

: I don't know if you made any particular notes on these handouts that you wanted to share with us as we went along. That was the purpose for that. I know did the sign up so we could talk to you later.

.: I guess all I'm saying is maybe the easiest thing would be if you'll -- we've -- we've pretty much talked ourselves out. But if you all want to convey any more information to us, you know, we -- we will come to you is what I'm trying to say either by phone. We'd like to record what -- what you have to say. I think we've gotten an awful lot today, but -- but certainly get back in touch and we will be happy to -- to get more recorded if -- if you think of other things.

': Absolutely.

22 .: So thanks to all.

23

24 (Whereupon, the affidavit testimony was

25 concluded.)

1 CERTIFICATE PAGE

2

I, , Court Reporter, do
3 hereby certify that this GSI Affidavit Testimony was transcribed by me to the best of my ability.
4

I further certify that I am neither attorney
5 nor counsel for nor related nor employed by any of the parties to the action in which this is taken; further,
6 that I am not a relative or employee of any attorney or counsel employed by the parties hereto or
7 financially interested in this action.

8 IN WITNESS WHEREOF, I have hereunto set my hand and seal this 18th day of July, 2006.
9

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11 _____

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[Court Reporter]
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