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FERNALD LIVING HISTORY PROJECT
Transcript

Name: Paul Ball
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Tape FLHPFLHP0148

07:01:04
Q:
First of all, if you can just give us your name and spell it, so we know we have it right.

A:
First name is Paul, P-A-U-L. Last name is Ball, B-A-L-L.

Q:
Great, and if you can give us a little bit of background, um, where you were born, a little bit about your family, where you went to school.

A:
Okay, I was born in a small town in Kentucky called McQuaida, Kentucky. And I went to grade school there and I graduated from high school in Hardenburg, Kentucky, the school name was Breckenridge County High School. And then uh, after high school, I moved to Louisville, went to work for Reynolds Mills Company. Worked about a year and then went in the Navy.

07:01:49
A:
I was in the Navy from 1943, July '43 until April '46. And when I was on, home, after the war was over I came home and my wife and I got married in November '40, 1945. We'd known each other before and went together before I went in the service.

07:02:12
A:
Uh, worked for Seagram's for about 6½ years and was laid off and went to work at um, uh, across the river at gunpowder plant where they made gunpowder for. Dupont ran the operation then. And I saw the article in the paper advertising for uh, chemical operators at Fernald. And I inquired, and within two weeks, I was hired and I come to Fernald in October 1953.

07:02:51
A:
And uh, I uh, started in the refinery, and before I was Q cleared, I had a P clearance. And then I finally got the Q clearance and went over into the refinery area, and started. And George Bassitt and I dumped the first drum of concentrates that was dumped in the refinery. At that time, they had what they call a skip hoist dumper; it wasn't like these dumb dumpers that you have now.

07:03:23
A:
It was, it operated on cables, and then when it went to the top of the refinery, it hit a limit switch and dumped and you hit a switch downstairs, and hopefully the ore came out, which didn't always (smiles). You had to beat it out with a sledgehammer or chop it out. That had been the early years. Uh, then when the refinery started up, I worked in, as a chemical operator in the digestive area, construction area, pyraffinate and sump area.

07:03:56
A:
Most o' my time because at that time, the refinery was two separate plants, Plant 2 and Plant 3. In later years it went to, combined and they just called it the refinery, 2 and 3, but it was still, the people that were in the union could work in either plant then, didn't have to worry about bein' transferred to temporary or what have ya.

07:04:28
A:
Uh, in 1972, I made shift supervisor in the refinery. And uh, I was after, in 1970, 1971 I made shift supervisor in the refinery. In '72, the refinery went down temporary. And I was transferred to Plant 9 and Plant 5, in the re-melt area for a total of about three years and I went back to the refinery again.

07:05:02
A:
And uh, in 1972, I was promoted to area supervisor, and was area supervisor in the refinery which included, Plant 2/3, uh, which was digestion, extraction, denitration, hot raffinate, uh, sump, refinery sump. Uh, which in, also in the refinery, was the metals ____, which was part of the operation over there, too.

07:05:46
A:
Um, in 1978, I, I went; before this, I'm sorry. I went to uh, Plant 5 a short time as an area supervisor. And then in 1978, I was a night shift superintendent. For about a year, and had, then after that I went back to the refinery, and in 1979 I was promoted to general supervisor. In the meantime, the refinery had shut down, cleaned up and what have ya, which it later re-opened.

07:06:25
A:
Just on a short, uh, just on a small basis. It didn't have uh; there wasn't much production, just small production. And anyway, uh, I went, was transferred to Plant 5 in 1981 as general supervisor, and I was there until December 1986 when I retired.

07:06:54
Q:
Can you tell us a little bit about how, like sort of plant by plant, how the process worked?

A:
Okay, in digestion, we'll start, that's where it usually started, in the digestion area. In the early years, we had the concentrate comin' in from different places like Colorado, Australia; Kerr-McGee had ore concentrate in, uh, I'll get into the Belgian Congo after I go through this. But it all processes practically the same.

07:07:25
A:
In this, in this area, you mixed up a, so many, x number of gallons of uh, liquid that was made up of your uh, low level uranium, barium materials, liquid levels, and you what, if you need to add water, you add so much water.

07:07:46
A:
For instance, if you made up 20,000 gallons of uh, liquid at 7 normal acid, and then you dump x number of drums into this uh, 20,000 gallons to bring it up to a certain concentration. Uh, and then also in the digestion area, we had, we processed slag leach. Now there was, slag leach was a byproduct of mag-fluoride for the process of Plant 5, and Plant 9.

07:08:22
A:
And it was uh; it was dumped also and digested; X number of drums to a certain normality of that a make-up liquid. And it was a sampled, uh, and sent to hot raffinate was filtered. And the filtrate, the liquid came back in the combined raffinate area, and was either, at one time was evaporated down and the concentrate, -tration was higher.

07:08:55
A:
Or it was pumped directly to digestion, dependin' on (yawns) pardon me. Depends on what the U (uranium) concentration was. And the, the slag, the solids were pumped down to K-65. The solids were put into a big tank and sampled, when it was inspected was pumped down.

07:09:13
A:
Okay, uh, now the Q-11 material from the Belgian Congo was a little different process, it was a little filtered before it ever went through extraction. It was processed in the digestion area then pumped through raffinate filtered and the filtrate was set back to go through extraction eventually and the solids were pumped down to one of the silos.

07:09:44
A:
And um, at this time they had the Belgian Congo had a gentleman here that monitored all of the material that was pumped down to the K-65. The metal dissolver, which was in the refinery, was just what it said it was. What we did we took first crops and secondary crops and I'll get into that later.

07:10:07
A:
And scrap metal that was out of specs ran acid, circulate acid over them and dissolved the metal and then that liquid went into the digestion area and it was eventually used for batch makeup to dump ore in it to bring the concentration up.

07:10:24
A:
Extraction. We usually liked to have the concentrations around 300 U grams per liter and about 2½ molality when we went to extraction. Now in the extraction, all of the extractions columns were built the same except in the structure they are built the same but they are actually different.

07:10:52
A:
There's a little different process that went into it. The extraction section, the columns ran from the second floor to the fifth floor and they were dome shape at the top and the bottom and inside this column there were plates with holes built into the plates and at the bottom you had a pulse pump of what happens. The material pulsated inside the column.

07:11:27
A:
Well, in other words, the feed went into the top and the organic in the bottom. As it pulsated through, the feed went through the columns. And the waste, the organic extracted the uranium out of the material and the raffinate, which pumped the hot raffinate; came out the bottom and the uranium just went over, just overflowed over the top.

07:11:51
A:
And from there it went into at one time we called a scrub column. What it did in the scrub column was only one column it took all the unwanted material out of the uranium before it went to the strip column, like molivian and stuff like that. You probably go in at 20,000 parts per molivian and when it went to denitration it had to be 5 parts or less of molivian so it did a good job.

07:12:27
A:
Then later on what they used was a couple of mixer settler tanks for the scrub section and you didn't have as much trouble with it as we did when we had the scrub section. And from the scrub section went to one or two scrip columns and it depended on how many you used and you had deionized water going to the top of that and stripped all the uranium out of the organic and all the organic went to the top hatch.

07:12:56
A:
And the organic went into what we called solvent treatment section and was treated, and I'll go through that. And the material that went out the bottom of the uranium till went to denitration and I'll go to that later. But this, uh, solvent treatment of the organic that we used was a carbonate wash, uh, operation that the washer carbonated and liquid and the mixer settler tank that the organic would wash down.

07:13:31
A:
And then from there it went through, we had a number of horse interferes, I think at that time. And then the inorganic went into a storage tank outside which was used over again and the wastewater from the wash went through the refinery and was treated.

07:13:57
A:
Now when we talk about deionized water, we had three deionizers there that we treated our water that we got from the Boiler Plant. The water that came from the Boiler Plant was called Z-light water and when we got finished with it, it had two types of resin with the deionizers, one was a cat ion and one was an ant ion resin.

07:14:16
A:
And they were mixed and took all the bad ingredients out of the water, and it was called deionized water when we used it, it was pure water. And um, then when it went to denitration, it was put outside in three holding tanks, sampled, inspected, pumped into a big tank which we fed to an evaporator in. And, um, it was boiled down to a ratio of about 4 to 1.

07:14:52
A:
If it went into 80 degrees, 80 U grams per liter, it was evaporated down to around 370, 380 U grams per liter. And from there, went down into a boil down tank. A tank that contained steam coils and it was boiled down to about 1,000 U grams per liter there and then it went down into a sparge tank and was boiled, steam coils, it was about 1,300 U grams per liter when we put it into the denitration box.

07:15:30
A:
So, we had different, at different time, I don't mean we changed each week, but we have charged 200 gallons, 250 gallons to each denitration pot and the denitration pot is just an oval type stainless denitration pot with double set of burners under it and you let the burners control the temperature at a certain temperature.

07:16:01
A:
And then that stayed on until you had an agitator that ran inside all the time while this pot was cooking. All the acids cooked off and the acid went to acid recovery. And then, we kept it cooking until it turned to powder from a liquid form and we had a test there that we tested to make sure that all the acid was out of it um, spot-check it we ran.

07:16:34
A:
Alright, from there we had a gulping system that was out by the big Conover blower that furnished the vacuum to vacuum out this material out of the pots after it was powder and put it into a, run it through a Williams mill. And the Williams mill dropped it down through a hopper usually ten thousand pounds each hopper.

07:17:08
A:
And then from there it went to Plant 4. Um, we have at one time run as high as 2 percent U-235 material and denitration we didn't go any higher than 2 percent. Now go back to digestion, we did have a dome digestion system. The material was of the higher concentration U-235 level. We put x number of pounds depending on the isotopic of the material and to each drum added nitric acid and heated it up with a coil that we put it out into the drum. And when it was dissolved, we'd filter it and put it into a hold tank upstairs.

07:18:02
A:
And that's how enrichment was used when we were running higher enrichments to bring the isotopic level up in the feed that we wanted to put into extraction. Okay, when UO_3, UO nitrate went to Plant 4. Um, I won't try to go into all this operation at Plant 4 because I operated Plant 4, I'm not much of an authority on it and I'm not going to try to tell you something I don't know.

07:18:36
A:
Anyway, it was, you had vaporized HF that you added to the material when it went through the banks in Plant 4 and to make a long story short, it was made into UF_4 and was sent to sampled, everything that went from one plant to another had to be inspected, sampled, what have you.

07:19:03
A:
Uh, from there the green salt was sent, or UF_4 was sent to Plant 5. And Plant 4 we had like we called a tank farm. We had ammonia storage tank, HF storage tank, acid storage tanks, uh that we stored material and if we needed ammonia in refinery we got the ammonia from Plant 4, tank farm.

07:19:31
A:
The blue HF was sent over to Plant 9 for dysurnal process and I'll get to that later. Now Plant 5, the UF_4 x number of pounds to each charge, but first of all, the charge went into a mag fluoride lined furnace pot. And it was uh, about, I don't know, half-inch thick wall. And the, had a uh, mandrill that went down in that pot, and that mag fluoride was put around the mandrill and jolted 30 minutes I think it was.

07:20:24
A:
And then that formed a liner all inside that pot. And from there it went to what they call the F machine, and that's where the charge was put in the UF, uh, the UF_4 and uh, magnesium was blended together in a blender and then dropped in to a uh, furnace pot.

07:20:47
A:
And there was a cap put on the mag fluoride and then they bolted the lid on top of it and tightened 'em down with a air gun. And from there it went into the Rockwell furnaces as a powder now. And you,

the temperature you set uh, we usually like to see 'em fire in three and a half hours, and sometimes you had to adjust the temperature on different Rockwell to get it to do that.

07:21:14
A:
It was around 1,200, 1,250 degrees. And then when, you could tell when the, when the firing time, when it fired. What I mean by firing was it went from a powder to a metal. And uh, plus it was a blip on your uh, chart, your temperature chart, when it fired, and you'd pull it out, with a hoist and put it back, take it back and put it in a air-cooled tank.

07:21:45
A:
It was air-cooled for some time, I, I think it was an hour or somethin' like that but I might be wrong. Then it was put over in the water well, cooling well, where the uh, cooling water circulated and cooled it off. And when it was cooled off, it was hoisted upstairs with a hoist, put into a breakout unit where they removed the lid uh, dump it upside down and went to the Williams mill.

07:22:15
A:
And out o' that came the derby. That's how we got the derby. The derby usually weighed about 350 pounds. And then the mag fluoride we, the enriched fluoride we sent to Plant 1 and they processed the mag fluoride up in Plant 1. But depleted, the normal, what have you, we processed over in Building 55 in, over in Plant 5. And what happened, we just used that over and over to make liners in the pots.

07:22:47
A:
And then when it got to the point when it was too high in uranium, then we'd ship it to Plant 1, they'd sample it and then it went through the refinery again, as a, through the slag leach system. And uh, same way it, that was the depleted and the normal. And enriched was handled the same way up in Plant 1, when they had, it uh, the uranium got too high in the slag, then they was processed in the digestion area.

07:23:22
A:
Back to the digestion area again, that slag was a pain. In the sense that we couldn't, we couldn't keep our pumps in sync because the material was so highly abrasive that it would just eat the pumps and the peller up. They bought most o' their pumps from Duron up in Dayton, until later on they started uh, repairin' their own pumps here on the plant. And uh, did a good job.

07:23:53
A:
Plus, I think they still bought some from Duron. And then again, that was sent to hot raffinate, sampled, and uh, I think I've said before, that was pumped in, the solids was pumped to the pit, and it's out in the pit now. And I don't, that's what I suspect they might have more trouble with out there when they start pro-, emptyin' those pits than anything else that's out there.

07:24:18
Q:
So what's that material again?
A:
Slag leach and slag. That's what we call the process is slag leach. Actually it was slag from Plant 5 that they'd use and, and uh, leached the uranium out of it in the filter.

Q:
So it's really just, it's like a by-product.

07:24:36
A:
Right.

Q:
What does it look like?

A:
Just looks like sand. Looks like, just looks like sand. It was you know. As a matter of fact, when once, back in the older days, when they, we were rollin' that Q-11 up, as sandy bases, we, this gentleman in charge decided to run then through the system. And we had sand bunkers all over the refinery; it didn't go too good (chuckles).

07:25:08
Q:
For a test?

A:
But we got to the derby in Plant 5. And the derbies were used back in the re-melt area to make up a charge, depending on if it was enriched, depending on enrichment. Uh, we usually stayed under the mass limit what they made the charge up. We didn't, you know, that's what we used. You need to use, use two derbies to a charge most o' the time. Scrap metal, briquettes, some ____ material which I'll get into later.

07:25:52
A:
Then that was put into a, was charged into a graphite crucible. In the bottom o' this crucible was a pour hole they called it, they put a plug in that pour hole when they, before they put a charge in it. It was put into the re-melt furnace and put a lid on, a graphite lid. And uh, the fire was put on the charge, and uh, if I remember right, it was eighty minutes to cook. For one charge.

07:26:33
A:
And what would happen, on the bottom they had what they call a mold tank, it had a mold in it, dependin' on what size ingot you gonna make. And when the metal got ready to pour, they had a, what

they call a knockout rod that slid across the bottom o' that crucible and knocked that plug out. And when the metal, molten metal went down into the mold, and actually there was cooling water on that all along.

07:26:58
A:
Uh, and then after it was set for a while and it cooled, then we took it out and put it in a cooling booth and would take it back in the lower, to the back end of Plant 5, and sampled it by ____, by uh, sawin' a sample off. What we did, we took uh, on the top end o' the ingot, there's a rugged, ragged end. The bottom was pretty smooth.

07:27:26
A:
But what happened, the pour plug and all the degradation and what have ya went into the ingot floated up to the top. And they went back and uh, took the top off and then took the sample. What they did, they sawed half way through and then dropped back about uh, eighth of an inch and sawed it off completely and then took the sample off of the top that they'd sawed half way in.

07:27:52
A:
Uh. Then it was put on a, we waited for the sample results and from there it went on to Plant uh, 9 usually, and, or Plant 6, the ingot did. And uh, there they were processed and whatever they were gonna do, whether they were gonna make outer uh, cores later on, or inners, or what have ya.

07:28:27
A:
They uh, drilled a hole through the center and then were sent to Ashtabula and extruded and then come back to us in, in rods, and they uh, processed them in Plant 6 and Plant 9. And then from there, they were shipped out to wherever the customer was that they were gonna, ____ go to the, whoever the customer was, that's where they went.

07:28:52
A:
Then in Plant 9, they had what they call the Zernlow process. We'd get this aluminum clad and zirconium clad, copper clad uh, pieces from off-site, and we'd put 'em in this uh, Zernlow system. And uh, as I said before, we would use the ____ you have to get the zirconium off. And we'd use acid to get the copper off, and that material after it got so concentrated, they would put it in a dumpster.

07:29:28
A:
Take it back to the refinery, put it in a storage tank over there and that would be used also to make up uh, feed blends for the extraction area. Digestion. Or to dump concentrates. Now we didn't, not only dump concentrates, but later on the concentrates quit comin' in, we were usin' uh, residues. And most o' the residues went to Plant 8.

07:29:53
A:
Went to Plant 1, and went to Plant 8, and then they were retrieved in Plant 8, either the, for instance in Plant 8, they had furnaces that uh, burnt the non-briquettable chips, made blackouts out of 'em. Uh, we uh, dumped uh, UF_4 into a rotary kiln, add magnesium and UF_4 mixed and dump that in the kiln and dried it and burned the magnesium off.

07:30:25
Q:
I'm gonna stop ya right there for a sec because we gotta change tapes.

07:30:28
A:
I run the tape already?

Q:
Yeah.

Tape FLHP0149

08:01:01
A:
You gonna get a pretty good size turbin.

Q:
Oh, yeah. Wow, okay. Um, you were talkin' about how once all the concentrates were gone, um, we were processing.

A:
Residues.

Q:
Residues. Tell us; tell us again about residues.

08:01:16
A:
Well, the residues came from the processes in Plant 5, 9, 6. That was the material that they uh, for instance in Plant 5 that they vacuumed off of uh, the jolters, which was slag. It was uh, material that they vacuumed in case they had a spill at the fill machine. They had green salt and uh, magnesium and, and slag mixed.

08:01:47
A:
Uh, at the breakout, they had dust off of the breakout that was magnesium that they, was a residue. And Plant 5 re-melt, you had uh, when you removed the crucible from the furnace after it, you, you

melt in it mold and you pour it into a uh, mold, crucible into a mold. It was removed from the furnace and (puts hand up to his mouth) pardon me.

08:02:19
A:
And that was turned upside down, and that had black oxide in it. and that went into dust collector, and from there it went to what they call a burnout. It went over a gas flame and burnt all the metal out of what was left in the crucible, and that made black oxide. And then when they charged the crucible they had vacuum there to vacuum everything off, that was residues.

08:02:48
A:
And then uh, well then Plant 8, you had your process all the residues through Plant 8, but it also had residues that went into the dust collectors. We had 17 dust collectors in Plant 5.

08:03:10
Q:
And they would collect what, those dust collectors.

08:03:11
A:
Different types of material and it was coded up the right code, and that way, you could look at the code and tell what, what operation it came from. In other words, if it was Plant 5, it had the, enrichment, the source, and what plant it came from, and the date. On the drum, it had to be we had to pre-code those drums before we used 'em. We didn't put anything in the drums before they were coded.

08:03:41
A:
Uh, had a lot. And we had some off-site, too. Uh, I guess your dustiest material would probably be black oxide, U_3O_8. That'd probably be, that'd be the most pure uranium that we handled. That was almost 100 percent uranium. Back in the days when we dumped the concentrates, or any type of material that we have it was, when they talk about it assayed so much, in other words it had so much percent uranium in it.

08:04:18
A:
In other words, you had a 100 pounds of uh, material in a drum, or what have ya, but you had more, and it assayed 3 percent, you'd have 3 pounds o' uranium in it. And uh, when measurin' liquid, uh, you went by gram, U-grams per liter. A 120 grams U-grams per liter was 1 pound of uranium.

08:04:41
A:
In other words, you had a 1,000 gallons of liquid with uh, it was a 120 U-grams per liter, you'd have 1 pound a gallon, you'd have 1,000 gallons of uranium. And when I talked to you before about the concentration of feed material goin' into digestion, it, if it was 360 U-grams per liter, it'd be 3 pounds to the gallon.

08:05:06
A:
So in a 20,000, or 20,000-gallon that's an example, you have 60,000 pounds of uranium. And no matter what you do, it doesn't matter how you do anything, if it's at 10 pounds of uranium, whether it be 10-gallon or what have you, you can put 1,000 gallons, you'd still gonna have 10 pounds of uranium. Your grams per liter will go down, but the, but you're still gonna have 10 pounds of uranium.

08:05:36
Q:
So what's the difference in processing the concentrates and processing the residues?

08:05:41
A:
There wasn't really any difference. It was just, you had to digest 'em all in nitric acid, and build a concentration to go through extraction. There wasn't really any difference in the process. When we first started in uh, digestion, we only had what they call a batch system. In that we just dump x number of drums into so many, much and pump it into a big tank.

08:06:05
A:
But later on, we had what they call a continuous system. In other words, we'd make up 20,000 gallons of uh, 7 normality material. And we run it through, say three digesters, continuous in other words, it run continuously say a 100 drums in each batch. And then sometimes we'd put, put the, aluminum. To concentrate the, to uh, counteract the fluoride.

08:06:34
A:
You have fluoride in green salt, so you had to have somethin' to counteract the fluoride, or it would eat the, clean the steel up. And, but uh, there was no difference in the process whether, in other words, whatever you had digested in digestion, it went through extraction. It was treated the same way. Uh, the only difference is uh, when ya got the concentrates; you didn't always know what ya had.

08:06:58
A:
Because it come from off site. And uh, I think for a while there, they took, they were takin' the word of the people that were sendin' us the ore on the assay, and it didn't turn out to be that, and so they finally started samplin' it themselves.

08:07:17
Q:
And that happened in Plant 1? Sampling? Or did that, was that all through the Lab, or?

A:
That was the sam-, well, they took the samples in Plant 1, but they sent 'em to the Lab and the Lab processed the samples. Uh. The, all the samples were, were processed in the Lab, but they were ones

that were taken out o' the drums were mostly taken from Plant 1. And then they sent 'em up; sent 'em to the Lab they processed 'em.

08:07:51
Q:
Was it easier to process residues or easier to process concentrates?

A:
It didn't matter. Dependin' on, it would depend on the material. If we had, black oxide was highly, uh, we had to watch it more, it was, it would erupt on ya sooner than some o' the other stuff would, but. No, we all, we got some black oxide in from off site, but it wouldn't make any difference. The black oxide was pretty, sometimes it go, get violent.

08:08:18
Q:
Now uh, did they ship black oxide in on the rail yard? Through the railway?

A:
No, I think they mostly. I can't answer that, but I think they got most of it by truck. I'm sure they must o' probably sent some in it. Had a dock up there that the trucks backed up in to and they unloaded it, but, truthfully I can't answer that, but I think most of it was by truck.

08:08:40
Q:
And uh, where did most of it come from?

A:
Let's see, they had a plant in uh, St. Louis, I think they had a plant out there. Uh, I think that was Kerr-McGee had. But we really didn't get that much black oxide from the other sites. And our depleted uh, to go up, a step up a bit, our depleted green salt came from uh, Paducah. And we process it here and drummed it and that went to Plant 5. But that would come in in hoppers, it was already; it had already been processed.

08:09:23
A:
And uh, that's what I called guts and glory (laughs). You never know what they sent us. It was floor sweepin's, they'd put it in the hopper. But no, the, the residues weren't any, processed any different. There, depended on the concentration, what it assayed, and how much acid you need, and how many gallons you were gonna make, and what have you.

08:09:52
A:
Uh, we uh, I feel that we went uh, went to the better all the time I was here, I don't think we went downhill. We might have, some people mighta thought we did, but. We used to have 10 people in extraction, operatin' the extraction, and later on we only had two. And we had people all over the place. I've operated the shift over there.

08:10:14
A:
Digestion, extraction, denitration, the sump, nitric acid, and hot raffinate with seven people. 'Cause the supervisor 'd run ya to death. You didn't have any, you didn't know when you were gonna eat lunch. That's why I said that somebody was talkin' when said, try to think o' somethin' funny, and I, I can't see nothin' funny about runnin' for 8 hours (laughs). From one plant to the other.

08:10:40
A:
Some people qualified and some weren't. It was just bad, because of the. What happened if you had a layoff, you would get, you might get seven people, you have seven people total, and four or five of 'em might be new, didn't know a thing about the refinery. So it was up to you say, "You do this and I'll be back." You know.

08:10:58
A:
But it uh. Back to the material out in K-65? When I first went to work, we'd go out on the midnight shift and dump drums of material and transferred up into the silos. And every once in a while, we would uh, decant the liquor off and send it back up to the sump. That was back in the '50s, '53. Uh, George Bachelor and I usually worked on the third shift together and we went out there.

08:11:32
Q:
Now when you said, "decant," what does that mean?

A:
The solids would be in the bottom, and the, and the liquid would go to the top, so what you do, you just decant the liquid off o' the top o' the solids, and that's what ya call decantin'.

08:11:48
Q:
Was there a building out there that pumped the liquid from the top?

A:
Yeah, there was a small building out there. Uh, I suppose it's down now, but it was there when I left. But I, they probably tore it down. There was a small building. It was just a storage building, but there were, this was mostly outside. The, the pump and the, what have ya, that we, see, we slurry it up and then pump it up into the silo.

08:12:11
A:
And uh, yeah, any material that's got liquid on top and solids on bottom, if ya take liquids of the top, it's called decanting.

08:12:23
Q:
So it uh, it settled out basically. It was a slurry?

08:12:25
A:
Yeah, the solids settled out, the solid settled out, the liquid go to the top, you decant the water off.

Q:
Tell us about the silos and the Manhattan Project.

A:
I, I don't know enough about it to tell ya. I really don't. I don't, I wouldn't know enough to uh, even go into it. Because I never, when I worked there, I was busy doin' other things, and I just, I don't know.

08:12:58
Q:
At the heighth of production, um, when there was tons, and tons, and tons of material going through the plant, uh, what was your life like?

A:
Rough, it was go, go, go. Uh, for instance, in other words, what I'm sayin' is, if you had to keep extraction runnin', and sometimes they run both sides. There were two sides. And one time we had a mix this other section in there too, that. You had to make sure that you got enough feed for extraction.

08:13:40
A:
You had to make sure that you take care o' the raffinate area, where all the raffinate went, you had to sample that and get rid o' that. Okay liquor and denitration. I've seen two evaporators run in denitration at a 100 gallons a minute. And it kept people busy. People were busy, I mean all. In every, if you did, _____ to get it done. But we had a good, good bunch o' people.

08:14:08
A:
We had some good operators, we had good supervisors, and we had good people that were in charge. Now I'm not talkin' about me, but I mean I'm talkin' about people that knew what they were doin'. Uh, they weeded 'em out until they found people that they knew could take care of it. Uh, I think I mentioned earlier, that at one time I saw 62 tons of uranium go through extraction in a 24-hour period.

08:14:39
A:
Now you put 62 tons of uranium in the, through extraction, somebody, it's gotta go, the rest o' the stuff's gotta go someplace else. The UO_3's that you made's gotta go be processed. It's just a, it's just a battle. I mean you know, you couldn't cross-contaminate anything. If you spill anything on the floor in de-, denitration you had to vacuum it up through the vacuum, high vacuum to the dust collector.

08:15:05
A:
You don't wanna put it in with the system. And uh, it was, it was uh, hectic. It was, and when you run for 7 days a week, 24 hours a day. And uh, I at one time worked, when I was shift supervisor, I worked uh, – 7 days a week, 12 hours a day, for about 8 weeks.

08:15:31
A:
There was only three of us, and one guy got sick, and the other two, got, I and another guy took care of. I worked from 8:00 at night until 8:30 in the mornin'. And he worked from 8:00 in the mornin' until 8:30 at night. And you met yourself leavin' sometimes, comin' to work. And it's hard on people to, to do that because you have to keep your mind focused so much, it just puts a strain on ya.

08:16:00
A:
Uh, it's uh, I enjoyed it. It was a challenge. It was really a challenge. Because there was always something to learn. You always had, anybody that'd tell ya they knew all about it – they was wrong. To this day I was in there all those years and I still don't know all about it. Of course I wasn't a technical man, some of those technical people could tell you but I was a production man, so I don't uh, well I knew something about it but uh, like I said we had a lot of good people and they got the job done. And for whatever reason they got problems now.

08:16:39
A:
The government said let's have uranium, we made uranium. And during the early days everybody was learning, it was a learning process. It was uh, you have to think what you're doing, you know what I mean, you didn't do just because I feel like doing this I'm gonna do it. And we had procedures, and we had'em posted in plants and everybody read the procedures uh, and if you went by procedure you did pretty well.

08:17:10
A:
And when you got up to be an area supervisor, or a general supervisor you could always write out the changes you wanted to the procedure and there uh, went through a process of health and safety, uh, plant manager, assistant plant manager and technical division and then uh, it was either okayed or it wasn't okayed so you could change a procedure that way. And uh, as a process went on you had to continually change procedures because you learned more about it. You learned what you could do and couldn't do.

08:17:46
Q:
So why was production so high? I mean what, what was going on in the world that we needed to make uranium?

A:
Well, again the government says we want uranium and if it came out of Plant 6 you gotta make it someplace else. And they want this much and they want that much we had uh, customers that wanted

and had orders in for this much for this material and you had to make it. I think that the latter part before the refinery shut down that we ran it through to get it, get rid of some of the residue. To get it into metal, if you get it in metal you don't have as much trouble with it as you do in concentrates, leaking drums and what have you.

08:18:32
A:
Oh, you have oxidation, some people call it rust but I knew some writers call it rust, but it's oxidation actually. And uh, you don't have as much, as I understood it, when you first pass an ingot that's when the rays are high on it than when it set around and oxidized a little bit. Now, I was in Plant 5 a couple of years before I left. We uh, on the storage pad, we had big aluminum sheets that we put up along the roadway to uh, block off what was on those uh, whatever was coming off those so people passing by soforth.

08:19:16
A:
I think I had first put up over there, I don't know if there still there or not. Between uh, Plant 5 and Building 12 there along the road, but that's what they were put up there for. And that's uh, again, I can't repeat myself too much we had a lot of good maintenance people, a lot of good production people, a lot of good people in the office that helped get the job done. That's the only way we could do it. We couldn't have done it if everybody didn't cooperated.

Q:
You were working mainly at the height of what they like to call the "Cold War" – and uh, how do you think that what Fernald was doing in those years contributed to America's mission.

08:20:05
A:
Well, I think it must of been pretty important. Because this was, I think this was the only big processing plant they had. So they had to have it. So, it must have been pretty important. At the time I didn't think much about it. Because I was 28 years old when I started, had two children, eventually had two more and it was a good place to work as far as I was concerned.

08:20:37
A:
I got a paycheck every two weeks and educated four children, and I was broke all my life naturally, but that's, I sent 'em to college but, it was worth every bit of it. And uh, if some people think that whatever they did out here hurt 'em that's alright. I have no animosity against them, what I done, I don't think hurt me. I don't, I don't, uh, whatever they think.

Q:
Now you mentioned getting a first a P clearance and then a Q clearance when you were working here. What's the difference between a P clearance and a Q clearance?

08:21:15
A:
Well, the P clearance you weren't allowed to go into the process area, then when you got the Q clearance you could go into the process area and start processing and operating.

Q:
And what was that process like? Getting a Q clearance? What did they have to do?

A:
That was a check uh, uh, FBI check, background check and what have you. I know they've asked a lot of people about me down in Louisville and what have you. I think they did it to everybody, they just, make sure you weren't a Russian or been in jail, or, or what have you. But that's, it was just a background check for security.

08:21:58
Q:
So, (To cameraman: is that okay? I thought it was poppin' over here on this) Um, what was the big secret at Fernald?

08:22:13
A:
I suppose the whole process. Because at that time it was new, and nobody knew about it. And like I said, it was a continuous, learning process for everybody concerned. And uh, really, if you don't know what's goin' on, you, you can't tell people much anyway, and they get it conf-, conflicting statements and so forth.

08:22:38
A:
It's like, it's like everything else, I mean, five people see a wreck, all five of 'em see it a different way. And uh, it was uh, that's the only, only thing I know. They stressed that pretty much.

Q:
And how, how did they, how did they stress security to you?

08:23:01
A:
Well, at uh, all the meetings. All the meetings and uh, safety meetings and what have you, they just said don't go out and tell everybody what you're doin'. It's uh, well, they didn't have to tell me because I didn't really know that much about it when I first started workin' here anyway, you know.

08:23:21
A:
And I think that was most people. You know, you got a lot o' people that uh, gonna tell everything they know plus addition. So if they don't tell nothin' at all, they won't get nothin' wrong.

Q:
And how did they check up and know that you weren't talking to folks?

08:23:37
A:
They didn't know. They didn't know. There was no way of knowing (chuckling). Unless you got in a bar someplace and got all tanked up and was shoutin' with joy, I mean, I don't see how they would know. But my, in my opinion, I may be wrong, but I think most people were faithful. I think they uh, they, they pretty well uh, I'm sure the people you talked to felt the same way about it.

08:24:04
A:
I mean it was a livin'. I had to work. Of course, that's, that's the only answer I can give you.

Q:
What, did they tell you the consequences if you did spill the beans?

08:24:23
A:
Not really. Not really. They might have and I didn't hear it, you know. That happens a lot o' times, you know what I mean? (Laughs) Because I was a operator then, I didn't, you know, they probably didn't realize how important it was because, my wife didn't know. I didn't tell her.

08:24:49
Q:
Tell us what a typical day at Fernald was like. What time did ya get here? Did ya have to take a shower? All that stuff.

A:
Okay, in the early days, when I was an operator, you went into, come into the locker room, get changed into your work clothes. In other words, everything. Socks, shoes, shorts, t-shirts, coveralls, cap. And then you went to work out in the plant. Uh, when we come to lunch, we couldn't eat out in the plant. We had to come through the shower, disrobe, and uh, go through the same process again, get different clothing.

08:25:39
A:
And then in the afternoon or evening or whatever time you got off shift, you had to go through the same thing and come in on the clean side and put your street clothes on. At noon, when you took your contaminated clothing off, took a shower, put your own clothes on and went upstairs. At that time, we had a 55-minute lunch period.

08:25:57
A:
You had uh, 15 minutes to shower and put your clothes on, 30 minutes to eat, and then 10 minutes to get your clothes back on get back over to the plant, so you had 55 minutes. I, like every place else, I suppose, there were few people always comin' to work early.

08:26:25
A:
And then when I got to be shift supervisor, I, I go to work at 4 o'clock, and the other sup-, you go to work, supposed to be at work at 4 o'clock, I'd usually get in at quarter to four. And the other supervisor, I'd give the other supervisor half-hour to tell me what was goin' on, pass on when, what was goin' on then.

08:26:45
A:
When I was area supervisor, I wasn't supposed to come to work at 8:00, but I was here at, most mornin's at 7:00, 7:15, made my tour, and went to the office. And went through the plants and found out what was goin' on and I knew what to do. When I got all the info before the day started, that way I know what to, how to plan my day.

08:27:10
A:
But it was, you could imagine, uh, on the third shift for instance, that was the shift I was on. They had two lines up in the cafeteria that fed people. And that time, you could get hotcakes, bacon eggs, spaghetti and meatballs, anything you want. 'Course then they started coolin' it down, and they cut the, after many years, they cut the cafeteria, shut it down

08:27:36
A:
And what you did, you went, took your own brown bag lunch, and had a microwave or what have you, and had drinks and coffee, and you eat in the cafeteria. Never, you weren't allowed to eat out in the plant any time I was here. I think the cafeteria had one line open on us, afternoon shift and two on the day shift at the time. I mean later on.

08:27:59
A:
Uh, when I first started here, you needed all the 55 minutes you could get to, to uh, you needed all the 55 minutes to get, change clothes, shower, go through the line and eat, and change clothes again, and go back out in the plant. You needed all that 55 minutes.

Q:
That doesn't sound like much time at all to get all that done (laughs).

08:28:21
A:
Oh, you get, you get to the point where you get a routine, and it don't take, you do all right.

Q:
Who were some of your favorite people here at the plant?

08:28:43
All of 'em (smiles). No, I mean, when I say favorite people, the people I thought got the job done was, uh, there was just, a lot o' outstanding people. Operators, back in the olden days, and I wouldn't

wanna be treadin' on somebody else's feet too, George Bassitt was an A-1 operator, and the other guy by the name of Tommy Burger that was an A-1 operator.

08:29:11
A:
Uh, and there was many, many more, and in the other plants, there were just excellent operators. Took a job interest, uh, I named those two they come off the top o' my head, but there were a lot o' other good operators besides them. People you could uh, give a job to, and you knew could get it done, and didn't have to worry about it.

08:29:33
A:
Then you had people that you give a job you have to check on it two or three times. That happens every place, so you don't worry about that. And the biggest thing that you do, or the biggest thing not to do when you're supervisor is what we always called "ride a good horse to death." You had a good man, don't work him to death, put somebody else to work, you know. That's all.

A:
But you got so much to do. But the people were great. Uh, as a whole, maintenance, didn't have trouble with maintenance, good maintenance people. Transportation? Never had anybody in transportation refuse, if I asked 'em to do somethin' without goin' through transportation, I never had any problem. But they were a bunch o' good people. And the people up front were good people, knew what they were doin'.

08:30:23
Q:
Okay, we're gonna take a break and change tapes again.

A:
Okay.

Q:
(Laughs) You're doin' great!

Tape FLHP0150

09:01:01
Q:
Okay. Now in the late '80s, right before you left, um, there was a lot of media attention focused on Fernald, mainly because of some dust collector leaks in Plant 9. How did you react to that as a long-time worker?

A:
Well, I'd always said that if I read the newspaper, and watched television and never worked here, it would scare me to death. 'Cause I figure that after 33 years, if it was gonna hurt me, it would of hurt

me. And uh, we had, like I said, they only had one dust collector, in Plant 9 we had 17. And it was a adjustment we had to, had to adjust in Plant 5 also.

09:01:58
A:
We finally got uh, somethin' that we could go by, a guideline on how much uranium we could lose out the stack. And later on, it was a uh, I think it was a, I think it 1kg if we lost, we had to report to the press. And uh, we had a lot o' problems uh, with the one dust collector in Plant 5. Finally when was there was, see a dust collector is made up of filter bags inside of an enclosure.

09:02:44
A:
And the air, or the vacuum is pulled by the exhauster. And the, the place where the dust, or the place or originates the dust, pulls through, into the bags and the air goes across the bags and exhausted out. So the problem we were havin', was the material was goin' through the bags. And uh, what you had on there when the differential pressure.

09:03:19
A:
Differential pressure is the pressure between the bags, in other words, if a bag gets coated inside, the differential pressure would go up. In other words you don't have as much air passing through that bag as you would if it was clean. And what was happening when the blow rings, they had a blow ring on there that automatically, when it reached a certain differential pressure on the chart that air, this type of material, especially black oxide would pull that out.

09:03:49
A:
Pull it through the bag. I'm not saying that's what happened to Plant 9, I don't – if it hadn't been that it would have been something else. And uh, what we did later on in Plant 5, while I was there, we put a counter on there, a uranium, a geiger counter, and you could tell it came off of a filter, a small filter, on this jar size, and when the reading went up on that geiger counter, it did it every time that the blow rings came on.

09:04:30
A:
So I said, well we changed bags, oh, so what I said was well let's do this. I asked my boss, he said well we'll try. Turn the blow rings off, when the differential gets so high, pressure gets so high, shut the dust collector down, and shake the bags by hand and get the dust out of 'em and you won't have that. And we ran for as far as I know, we were running, they were running that way when I left. And uh, that's no way to run a railroad, but hey, it worked.

09:05:03
A:
And so, but uh, and we had a lot of visitors. We had Glenn came through and his staff, and what was uh, that one from Cincinnati, I can't think of his name. He came through, Glenn came through quite often. I think he was here two or three times. And it was Open House I thought at one time when they, the newspapers, they had a few _____.

09:05:34
A:
But I didn't get to, I was in the Navy for three years, almost three years during World War II, so, I, it took a lot to make me – shake me up or whatever, you know. I didn't think I was gonna see anything worse than that anyway, so.

Q:
When uh, when this all happened and there was talk of shutting the plant down, and eventually it did shut the plant down, you know they shut down in '89. Uh, how did you react to the news that they were gonna, I know you were gone by then, but how did you react to the news that they were gonna shut the plant down?

09:06:09
A:
Well, I, I, uh, could see it coming back in '86 when I retired. I could, you know you could look, they weren't doing anything with what they were making, you know what I mean. I mean you've got to get rid of what you're making or you can't make it. Uh, it probably surprised me a little bit when they shut it down completely.

09:06:27
A:
But the way they shut it down I couldn't understand why they didn't, when they were gonna shut it down, why they didn't clean it up when they shut it down instead of just leaving it sitting and clean it up later, you know. And that's what happened... they just shut it down. Uh, as a matter of fact, at inventory time, the plant was about as clean, uh, I say about, it wasn't as clean as it was gonna be at shutdown.

09:06:56
A:
But at inventory time we cleaned up everything out anyway. Sometimes that was once a month, sometimes three months that we shut down two or three days and cleaned everything out, dust collectors, all enclosures and uh, but no, I, I, uh, could see the handwriting on the wall.

09:07:15
A:
I didn't know when it would be or what it would take to clean it up. I didn't have any idea what they were gonna go through to clean the place up.

Q:
So had they done, uh, a proper shutdown instead of a hot shutdown, how much time do you think they would have saved?

09:07:33
A:
Oh, years. 'Cause they didn't have as much red tape. We didn't have, it was all done legally, don't get me wrong, I mean it was done within the limits uh, for instance, if you, an operator, even back in the old days, got contaminated more than usual we sent 'em to the dispensary to take a urine test.

09:07:58
A:
At the end of the shift, and before they went back to work the next day they had to take another urine test. So uh, yes, in my opinion if they had cleaned it up at the time instead of just dropping everything it would have saved lots and lots of time. Now I don't know how long it uh, I don't know if they even have got Plant 5 cleaned up or whether they've got the refinery cleaned up.

09:08:25
A:
I don't know – I haven't paid that much attention to it but, at one time the refinery was pretty clean. All the tanks, every, I know because I went through with 'em and we checked 'em. I lifted the man-heads on every tank in the refinery one time, we inspected before we _____.

09:08:42
A:
But uh, no I, I figured it was gonna happen sooner or later, you had so many build up of derbies and all the residue. And they couldn't do anything with the residue. Had to do something. Nobody was buying the stuff.

Q:
So there was a backlog of product when you left in '86?

A:
Oh yeah, yeah, yeah!

Q:
Now how long would it have taken if they had just run the lines clean?

09:09:10
A:
Well uh, you mean clean up, shutdown and tear the building down? Oh, I have no idea. I'd say probably a year I guess it would take to clean in out completely with the people they had at the time. Under the same circumstances.

09:09:27
A:
I realize they have different circumstances now – restrictions are tighter, and uh, uh, I sometimes think it's overkill but that's not, I don't make the rules. For instances, uh, when I came back in '91, '92 and '93 as a consultant Plant 9 was almost gutted out, cleaned up. I walked through there with my street clothes on, with my contaminated shoes many, many times and during the operation I had to get, had to have an escort because I had uh, there was two guys that had been here three weeks that had what they call Rad I and Rad II training.

09:10:08
A:
They had II and I only had I and they had to escort me through Plant 9. With shoe covers, smocks, head, gloves, you know, that's alright, that's what they want. I have no objections but it's, that's how much the rules have changed.

Q:
What was it like going back into a plant where you just wore pretty much your uniform to work everyday and seeing people in full anti-C's and respirators and.

09:10:38
A:
Well, you've got different mixed emotions ya know. Well that's what they want but, uh, I'm not the one to judge on the rules that somebody else makes. I think, again, I think it's a little bit overkill, but if that's what they want, I wasn't here so I wasn't involved.

Q:
And what do you think about the continuing cleanup now?

09:11:05
A:
I think it's awfully slow. I think, and I think they're gonna run into things out there in the pit that they don't realize that they're gonna run into. They've got a building, I understand, out there but they won't let's pump anything into it yet.

Q:
What are some of the other big cleanup problems that you see after having been here for 30 some years?

09:11:28
A:
Well, the ground under the refinery in Plant 6, uh, that's too, and Plant 5, Plant 5 won't be as bad as the others. But I know the refinery in Plant 6, the ground under there has to be contaminated, because all they had were brick floors in those refineries. And also Plant 6, in the heat treater area, the acid wash area, they had brick floors. At one time they replaced a floor in uh, the digestion there under the south floor under the denitration area they replaced the floor one time. And the pyraffinate, there's gonna be a lot of contaminated soil in there I hope they realize that. A lot of lot of soil.

09:12:32
Q:
And once this place is all dismantled and closed down and everything, what would you like to see done with this land?

A:
I don't want to answer on a mic, but it doesn't matter, you know. I mean if that want to make a resort out of it you know, a bird resort, or if they want to farm it, which I don't think they will. That's all right, I'm not gonna be around long enough to enjoy the benefit of it one way or the other you know.

'Cause I think it's gonna be that long before they do it. I'm 74 years old and I don't think I'm gonna be around another 20 years – that's just my opinion.

09:13:15
Q:
Uh, have you heard anything about the on-site disposal system? The on-site disposal facility at all?

A:
No, I haven't really gotten into it. I know it's changed. But I don't know. I don't know anything about it.

Q:
And uh, are you aware of the fact that they're shipping waste off-site?

09:13:35
A:
That they should ship it off-site?

Q:
Uh-huh, what do you think of shipping waste off-site?

A:
Well, it's somebody, everybody's loss is somebody's gain and I think somebody is gaining what we lost. That's the only thing I can tell you. They gotta do something with it, if they're gonna clean it up it's gotta to someplace.

09:13:54
A:
So, hey, I don't think that if they have a small spill that's not gonna hurt anything, I don't think it's gonna hurt ya anyway. I wouldn't want ya eating it. But I'm saying a small spill's not gonna, I don't think is gonna – everybody else, the higher eschelon is gonna decide that and I think anything that's small they're gonna make a – anytime politics is involved it's gonna be big.

09:14:20
Q:
Let's see, umm, is there anything that uh, we didn't cover that you wanted to cover?

A:
I can't think of anything.

Q:
Oh yeah, I know of one thing, that was in my mind and I almost forgot it. Uh, are you on the medical monitoring program?

09:14:38
A:
Up at Drake?

Q:
Uh huh.

A:
Yes.

Q:
Can you tell us a little bit about that, how you got involved and what you have to do?

09:14:43
A:
Well, uh, it's uh, uh, voluntary. You don't have to go. I've been up there three or four times. I think it's wonderful. I think it's great. I'll tell ya why – I had trouble breathing for several years. And I went up there for my physical and they found that I had water around my lungs. And I was put on a water pill and that relieved it for awhile but evidently it wasn't strong enough, I'm on a pill and a half a day, cause I went to the hospital last September.

09:15:31
A:
And they took 8 pounds of water off of me. Since then I've been doing great. But they, as far as I'm concerned, they do a real thorough physical and uh, as far as I'm concerned they treat me wonderful. I have no uh, I can't say nothing bad at all about it. And another thing about it, you don't get the same doctor every year, and you get, you know what I mean.

09:16:00
A:
I think when you have the same doctor, I'm not saying they overlook something but they tend to look at the past and say well you're alright. But they give me a thorough physical as far as I'm concerned.

Q:
And uh, right about the time you left, or shortly after you left they uh, filed a class action suit on behalf of the workers. Can you tell us a little bit about that – what your reaction to that was?

09:16:26
A:
Well, I never really thought I'd get any money, I took it, you know what I mean? Uh, the only thing I have never figured out is the fact that, and again, I'll make this statement, if the people that really pushed that thing thought it really harmed them that's good, that's their business. I don't think it did. I mean I took the money, don't get me wrong.

09:16:54
A:
I'm like everybody else. But the only thing I could never understand, I think I can understand, but these people that live around the project, got all this money and the people that worked there only got a small amount of what they got. But uh, if I'd never got it I'd never worried about it. I'm not saying that I got that much money, but I could have lived without it. I'd probably bought a car or something with it that I didn't need.

09:17:28
Q:
Great! Did we cover everything? Is there anything that you wanted to add?

A:
As far as I know. No, no, as far as I know. If you're happy, I'm happy.

Q:
Okay! Great! We're gonna do what we call nat sound right now. It's just if uh, we could have it quiet on the set for about 30 seconds.

A:
Okay!

09:17:45
Q:
This is nat sound!