

Nevada Test Site Oral History Project
University of Nevada, Las Vegas

Interview with
Frank Solaegui

December 1, 2004
Las Vegas, Nevada

Interview Conducted By
Joan Leavitt

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[00:00:00] Begin Track 2, Disc 1.

Joan Leavitt: *I am here with Frank Solaegui and I really appreciate your taking this time. This will be very valuable for us historically. Could you start off by telling us your name, just kind of pronouncing your name for us, and when and where you were born?*

Frank Solaegui: All right. My name is Frank J. Solaegui. I was born and raised in Fallon, Nevada.

Nevada boy. OK.

Yes. My father and mother were both—well, I'm the first generation of foreigners in this country.

Your mother and father were immigrants?

Yes.

OK. Where were they from?

Spain. Actually from the Basque country, you know, there are seven colonies that—so, you know, that's my background mostly.

So your mother and father, did they immigrate together?

No. No. She was about sixteen years old when she migrated over here, and so was my dad.

You know, I used to ask him, They didn't want you around the house?

Well, he says, you've got to understand that those families, there is no industry up there where those colonies are at.

Colonies, you're still talking Spain?

Yes. As far as jobs, very few of them, you know.

Now they had mining there, though, didn't they, in Spain?

Oh, yes, but not in that particular area. And those jobs for the most part are maintained by family through generations, you know, father, son, and right on down the line. So when you talk about employment for strangers, it's almost nonexistent unless there is a new technology that has come about in that particular field.

Are you saying it was economically depressed and that's the reason they migrated?

Well, there was no work.

OK. And he was able to come to the United States; this would've been around the turn of the century?

Yes, early part of this century. I believe it was 1916 when my mother came over and about 1915 when my dad came over. They were sponsored by a family that owned large ranches out of Elko, Nevada. At that time any recommendations that this family made as far as foreigners coming over was accepted immediately. That's how they came over.

How did they meet this foreigner from Fallon? Did they ever tell you?

In Elko where this individual was at there were a number of people that knew of this person, this family that was sponsoring.

What was the name of this family, do you remember?

I've heard it but I keep forgetting.

That's OK. If it comes—I was just curious.

But you see when they made an application to come over, they had to have a sponsor. And when this gentleman's name was placed as the sponsor, there was never any question, there was never any problems that resulted from anyone that they sponsored. Well, this family owned a large part of a valley. I could tell you where—out of Jack Creek, Nevada. My dad went to work on the

ranch for, oh, a year or two. My mother worked there in the—they had a boarding and a rooming [00:05:00] [house], two-story large building.

So what did your father do on this ranch?

Whatever was needed.

Kind of a ranch hand?

Yes, as a ranch hand.

OK. And your mother worked in the cooking?

Yes, maintaining the rooms and what have you where people stayed.

Now they weren't married at this time, though.

No.

But that's where they met.

Yes. So anyway, that's where the acquaintanceship started. At a later time, possibly at, well, I'd say 1917, is when they married. They moved out of there to Golconda, Nevada where my mother and an uncle's wife managed a rooming and boarding house. That was a large railroad town at that time. That was Golconda.

Where is Golconda?

Golconda is between Elko and Battle Mountain [Battle Mountain and Winnemucca]. But at that time it was, I've got to say, quite a large town. It was the center point for shipping of cattle.

We're talking about days before trucks. The stock would be driven into the corrals which the railroad had, and they would be shipped from there.

There were a lot of ranches up there in northern Nevada?

There still is. But they're not as large nor operated in the same manner as they did then. So anyway, to make a long story short, that's where the family started out. My oldest brother was born there in Golconda.

In Golconda. And where were you born?

Fallon.

And what year was that? What year and date was that?

Well, in 1921.

Nineteen twenty-one. Month and date. What is it?

January 26, 1921.

January 26. You're going to have a birthday soon. And is that where you grew up, in Fallon?

Well, I say I grew up and went to school there. When I got out of school I left there because other than working on a ranch, there was nothing in Fallon for the young people to do. So they were all leaving, migrating to different places. And I went to work in a mine. You know, I tell people—[they say], Boy, you must've made a lot of money. I say, Let me tell you something about the pay scales. You were very, very lucky to receive that because of the people that were looking for work.

Well, this was during the Depression, wasn't it?

Oh, yes.

And mining was the main place where there was any work at all.

Correct. So anyway, they used to always say, Four dollars a day for muckers and five dollars for miners.

And what'd you start out with?

Mucker.

You started out doing mucking.

That's where you do the shoveling.

Is that shoveling whatever—?

It's rock. In the mine that's all there is. And in that position you learned the other things that are related, such as drilling and handling explosives, loading these rounds after they're drilled to break the rock and what have you.

What kind of mines did you work in?

Gold and silver mines. But anyway, I always get back at that four dollars a day. They say, well, what the devil could you do? I says, You could do as much with that four dollars as you can with a fifty-dollar bill today.

I remember my mom and dad said their rent was twenty-five dollars a month, and that was in 1935.

Oh, yes.

[00:10:00] *How long did you work in that mine?*

Well, in that mine I worked about three years after I got out of school. I went to work for a contractor out of Hawthorne, Nevada. It was the Naval Ammunition Depot for storage. There were two contractors there and of course this was at a point in time when—I'm sure you're familiar with the term "cost plus."

Tell me what it means.

It means whatever the contractor pays or it costs him to operate is reimbursed by government.

So anyway, I went to work there and I actually liked the work very much. They were doing different types of work. They were constructing a dam up in the canyon out of the town site nearby several miles to provide the water for the depot. Prior to that, that water was supplied by water wells.

So I went to work for this contractor. My employment in the mines did not relate to operating equipment or what have you. And they were very good. First [they said], Hey, how would you like to learn how to drive these large trucks?

Oh, so they were giving you opportunities.

Oh, yes.

Doing more than mucking.

Yes. That mucking was behind me.

You didn't like that very well. You wanted to learn some other things and go on.

Oh, yes. So anyway, I worked there as a truck driver and an equipment operator.

So you got to actually do work on mining equipment, is that what you're saying?

No, this was construction equipment.

OK, construction equipment at this point.

And I went to the service from there.

Now which branch?

I was in the parachute infantry.

And was that at the beginning of the war [World War II]?

It was 1942. As long as you had good health, physically in good shape, you could get into the paratroops, which paid fifty dollars more a month than regular infantry. That's how I got into the paratroops.

Is that the reason why you went into it, because there was more money?

Initially yes, but I really liked it.

That's a lot of jumping out of airplanes. So you spent the war jumping out of airplanes, is that what you did?

Yes. So that's life.

Are there any experiences that kind of stand out in your mind of that time, 1942 to—was it to the end of the war, till 1945?

That is.

Now was it in Europe that you were or was it in—?

In Europe.

Which battles were you in?

Well, I was in the invasion of Normandy, and Holland. Then there were, I'd say, other battles that we did not jump, you follow me? And after about three years of that I wound up—well, it was 1944. I thought I would like to go into the service. Just with a snap of the fingers, you know.

To make it a career?

[00:15:00] Yes. Well, to make it a career but at a later time I changed my mind, which was bad because there were officers in this organization that I was in, the 101st Airborne Division—they were building up other divisions, you know—that would tell me, you ought to think about getting into the military on a permanent basis. You know, you're a young man. When you're about in your late thirties, you'll be qualified and eligible for retirement, and you can either stay or seek other work and still get a retirement paycheck. So there were things that encouraged you a little bit to think about this. Well, during all of this thinking and what have you, along comes World War II. It stopped all of that.

Oh, you were thinking about that before World War II?

Oh, yes.

OK, so you were thinking about making it a career before the war came.

I was, yes.

Oh. OK, that makes it clear, because it sounded like you were thinking about it after you had been in. OK, so World War II comes along and you changed your mind about making it a career, is that right?

I was drafted, so they made my mind up for me. And I was in the service four-and-a-half years. When I got out of the service, I had sort of changed the thoughts of what I'd like to pursue in life, not really knowing what in the devil I wanted to pursue, you know? You're kind of confused because you're getting into a different world.

Yes, going back to the normal and what is normal.

So anyway, after leaving there, after I got out of the service, going back, I was just driving through a town where I had met this individual that I worked with at Hawthorne and he says, Hey, you looking for a job?

And I says, I haven't learned to eat or what have you yet without having one.

Boy, he says, I'll tell you what. You just follow me.

He was a supply man, warehouse and supply, for a mine that was about twenty-five miles out of Eureka, Nevada. So that's where I went to work. I worked there for about—well, until September. There was a company that was sinking a shaft just on the outside of Eureka, Nevada and they were looking for shaft men.

Now was this also gold and silver mines?

Yes.

OK. And a shaft man, is that something that all of the gold and silver mines do?

No. There's different phases of mining operations associated with gold and silver mining. First, there's the drilling and locating, and then driving tunnels or shafts to where the ore bodies are at. You'd have to do that with any metal or mineral that you're pursuing.

So now you had an opportunity to do shaft work.

Yes. And that paid—well, I'll tell you what it paid. The mine that I was working at paid seven dollars a day.

Well, that's getting better.

Oh, yes.

Now how much was the mine you went to, then?

It was twelve dollars a day.

Now this was right after World War II.

Yes.

So you're talking 1946?

Six, right.

OK, twelve dollars a day. OK.

That was a *lot* of money then.

And that was shaft work.

Yes.

Now is shaft work a little more dangerous? Is that the reason why it would be more?

Well, it is in a way but it's a little harder than actual mining because you don't have the

[00:20:00] convenience of all the equipment that you have driving tunnels.

So is it more drilling equipment? Doing shafts, is that using more drilling equipment?

No, not necessarily drilling. You need drilling equipment to break the rock. You drill the holes with blasting. And of course then the material has got to be taken out. They had their own mucker which had a clan that operated it, a clan that loaded buckets.

So that is how things got started. I also met my wife in that particular town.

What name was the town?

Eureka, Nevada.

Was her father a miner?

Yes. Prior to that they had been ranchers, but intermittently he'd work in the mines. Ranches paid a dollar a day, you know.

So you got married in Eureka, Nevada?

No.

You just met her in Eureka, Nevada.

Right. And in 1950 we were married. Six months after our golden wedding anniversary she passed away. That's my life story. Life has never really been the same since she passed away.

And I believe that anyone that is married that long goes through this same thing, you know. You see these things, the manner in which they're done and how people respond to certain things, you know, from your marriage, but everybody doesn't live the same.

So anyway, as a matter of fact the year she passed away, well, it would be just a little over four years ago, which is to me surprising and yet something I haven't figured out to this day, we all had Thanksgiving dinner. She was there joking with all of the guys that were there. She had a physical exam scheduled the following day at the hospital. Well, she never did, you know, five days later she had passed away.

It was fast. Really fast.

Yes. Well, she'd had a physical several months prior to this and it was not detected. She had cancer of the kidney. That's what she passed away from.

Oh, and that is really fast.

Five days, you know. Well, in a way it was better that it occurred that way than laying in the bed for months.

And you did have Thanksgiving together.

Yeah.

So you began your life in 1950 with her. That's a good love story right there. Golden anniversaries. That's very special. That's a special—

Let's see. So you were working in 1950 and this is in—where was it again that you were?

Getting back to your story.

Eureka, Nevada.

And how long did you stay in Eureka?

A short time after we were married, we moved to Ely because of a better job.

Oh. Even better than fourteen dollars a day? Or was that the fourteen dollars a day?

The company was real good. That was Kennecott [Copper] that I went to work for. And anyway, [00:25:00] I liked it better. And my wife liked it better. So that's where our family was started.

And you have one son. Do you have more children?

We had tough luck with a family. We had one boy that passed away, oh, thirty, forty hours after birth. And then we had a boy that had cerebral palsy, and he lived until he was sixteen, but he never passed away from anything related to cerebral palsy. But anyway, that's his—his picture was there.

So you had three sons, then, is that right?

Correct.

Janie Solaegui: Two sons. And a daughter.

We didn't get to the daughter. You have a daughter. Where is she?

Frank Solaegui: They're all passed away except my son that *she* is married to [referring to daughter-in-law, Janie Solaegui] that lives here. This is their own home.

Oh, the daughter also passed away.

All the children other than my son that works at the [Nevada] test site.

Oh, Danny [son Daniel] works at the test site?

Yes.

Oh, OK. Donna Neese had said that you and the Neeses share a cousin or a grandson, or what was it? A grandson or a nephew or—anyway, there seemed to be some connection with the Neeses. She told me about your son.

He's worked at the test site now twenty-four years. He works there now. He has a good job, which I am grateful for. So that's life.

OK. Now I heard that you had—and this is actually getting back to World War II—that during World War II there was some things that you were kind of a hero about. Would you mind talking about that?

Well, anything that you live through, there's things that you have to do that's either a matter of continued life or immediate death. But I was battlefield-commissioned.

What rank were you commissioned to?

Second lieutenant.

Oh, you were?

Yes, from a sergeant to a second lieutenant. See, everything at that time in my life, as in many others, was depending upon the money that these positions made. And there were officers that were in the companies that I was in and what have you that kept telling me, Solaegui, you ought to make this a profession and put in the twenty years.

Do you wish you had, in a way?

Yes, yes, because I could still have done a lot of things after thirty-five, thirty-eight. This would be another lifestyle, you know.

That pension would have been nice.

Oh, yes.

And you kind of enjoyed the work, too, didn't you?

Oh, yes.

But your life took a different detour. So you were battlefield-commissioned. That must've been actually really during a difficult time, then.

Yes. It resulted from the officers in the company that I was in, all but one of them had been [00:30:00] killed, so I was performing as an officer for about six months until the division manager says, Hey, we've got to stop this. We're going to hang a second louie [second lieutenant] on you.

And I says, Does that change the pay?

He says, Oh, yes.

Was it up or down?

Oh, it was up.

Now how did you feel about officers? Some noncommissioned people don't like officers at all.

Right. Right.

They wouldn't be caught dead being an officer.

Well, let me tell you, you raised an interesting question there. There are people who are both enlisted people, noncommissioned, and commissioned officers that have a dislike [for the] way of life. I really like it myself, you know. That's why after, oh, I'd say after six, eight years in the service and people would say you know, You ought to think seriously about the regular Army. See, by that time I had increased my rate to a first lieutenant, you know, and an

increase in pay and responsibility. I often think about it and I thought boy, you know, what in the heck would I do? And really there were parts of the military that I *disliked*.

Did you? What parts?

It was some of the direction that you got from much more senior officers. The problems come about that if you raise some question about that decision, you get a little stamp put on you, you know, he's a troublemaker.

Insubordination?

Yes.

Are you saying that they're not open to suggestions?

Right.

And so there is no creativity.

Right. It's gone.

And what did you think about that?

Well, life goes on, that's just the way it happens to be in that particular area. There were parts of the military that I really liked and when we talked about this other officers would say you know, you're qualified and you ought to think seriously about going to Germany to one of the U.S. bases there and boy, that will be a citizen's pension. Your responsibility is considerably less and it's continuous.

And this was after World War II when they were rebuilding Germany?

Yes.

Oh. "A citizen's pension." What does that mean?

Well, you're paid by the military and you pursue another job in civilian life out of the military.

But you said no.

Well, I tell you what, I often thought that was a bum decision on my part because I could have put in the rest of the years to fill out my twenty years, which would've required about, oh, eleven or twelve more years in the service.

Oh, you had been in the service already for nine years?

Yes.

You were halfway there.

You see, because overseas is two-to-one, you know, and anyway I thought about it and I said, [00:35:00] what the *hell* do I want to stay in the military for, you know, and get up and shine your shoes and put on your necktie? I often have thought about it. My sense of values was really off kilter.

Well, maybe there was something else that you were supposed to do, because the test site has kind of a military mindset with some of the procedures and things that they do.

So anyway, after I got out of the military I [was] back again mining. And then I came to the test site.

Now you knew Bill Flangas somewhere else. Is he the one that got you to come to the test site?

He mentioned that, yes. I had a job in South America that I was preparing to get the family ready to go over there.

You already had a job offer?

Yes. And this particular day I happened to go over to Ely, Nevada. That was Bill Flangas's birthplace and home. And he says, Hey, he says, you know, I've been down at test site now for about a week and boy, they could sure use you down there, and all you've got to do is just get down there and say you want to go to work in the underground, which I did, and thirty-three years later—

Now did you say, How much do they pay?

Oh, I knew.

You knew they paid well.

Well. Yes.

Their reputation had—

Yes, it gets around pretty good.

So you came down. Were you planning on staying for a long time or was this supposed to be for a short time?

Not too much planning other than the fact that it was a job and a pretty good one until something better come along.

Do you remember your first impressions of the test site and its work?

Oh, yes.

What were they?

I tell you what, I've never seen anything quite like this because it was a place where there were people from all over the United States, and it seemed to be that the assignments to most of the people was not really in the area where they should be assigned. And this was a part of the problem in the underground. They were starting to do underground tunnel work.

Now this was 1958?

No, no.

Which year was that?

I want to say 19—

Was it the Rainier event that you were preparing for?

I went to the test site just after the Rainier event.

OK. Because I do have a list of the tests, if that would be helpful. Now I can get that out. Let me do that.

I believe you're right, though, in 1958 in June. I went to work at the test site June 30, 1958.

OK, June 30, it looks like—well, I don't know if this is helpful to you at all. We're looking around June 30 here [showing list] and we're looking at Operation Hardtack and of course this just tells—this is in the islands here. Most of those were the islands. So you said it was after Rainier. So did you do work on Rainier?

No.

OK, you weren't doing any of that. OK, we've got the underground right there, '57.

When I went to the test site there were two other tunnels that they were just starting, long ones.

So they were just starting to dig out the tunnels, then?

Yes.

[00:40:00] *Which tunnel were you in?*

E Tunnel was the first one that I went into, which later on, you know, grew by additions. It was in fourteen hundred feet. The problem with that tunnel and also with B Tunnel, which was the other tunnel, is that they did not have qualified miners. You see, the work at the test site underground was still somewhat new.

You have any idea why they hadn't thought about using miners before? Was there a scarcity of miners?

No. No, the location of the jobs and still being somewhat new, they didn't have any idea how long these jobs might last.

Well, was there any union-type expectations that miners did some things and construction workers did other things? Was there any kind of a division at that time or was it more loose, more general?

Well, I'd like to say yes, but no, the unions got started in there quite early. The miners did the mining and the equipment operators operated the equipment and truck drivers [drove] the trucks. *Then why were construction workers doing mining? They called themselves miners?*

Well, they're called construction workers but they're within the miners' union.

OK. Were these some of the people that you said shouldn't have been doing what they were doing?

There were quite a few, and there were people that were strangers to both mining and the particular area. They were job-hunting. And at that particular time, if someone said I'd like to go work at the test site as a miner, you went to work.

They let you. So it sounded like they needed men. They needed manpower. If you were willing to drive it, you were a warm body and they'd give you a chance?

Right. But that was bad because there were people that came to work there in assigned jobs they had no knowledge of and the work, the job, reflected it, you see.

Now especially the building of the tunnels, was that right?

Yes.

I know Bill Flangas had said that when he walked into the tunnel it scared him. It scared him because it was an accident—

Did he say why?

Well, maybe you can describe it better because he said why but I didn't really understand it, but it sounded like it was shoring up of the tunnel in some way.

All tunnels in mines and other areas have a semicircular back, and the walls are straight. There's a reason for that, is because of the weight to prevent the larger sloughing, you follow me, of rock and what have you. And any time that there is any possibility of something sloughing, steel sets are used. At the test site, for example, when I went there the main tunnel was in fourteen hundred feet. It was an eighteen-foot-wide tunnel with a flat back.

And you had expected it to be curved.

Oh, yes, but I'll have to tell you about that. The tunnel superintendent whose name was [Donald] MacGregor, I told him, I said, Someone's going to get killed in here because of [00:45:00] that flat back. There are large slabs that form from the small fractures in the rock. Well anyway, he looked at me as if to say, You think you know everything. But about four or five days later there was a man that was killed there. Well, certainly that requires a big discussion and the reason for that and what the problem was.

Immediately they went to rounding the backs and using steel sets instead of flat, straight timber.

Now was this before or after you were hired?

This was after I was hired.

After you were hired. So they knew you knew what you were talking about. Were you able to train the construction workers or did you just mostly replace them?

Well, you train and replace as they're available. Because that was bad. There were people there that this was their first time underground, and assigned jobs they had never done, you see. And that happened and existed with both tunnels, both B and E. You'd see these things and yet in my position you can't really do anything about them. You can't make company policy because of the need at that time of miners. They had ads in the papers to the outlying communities and they would see that hey, there's a mining job over there.

All they saw was a job.

Yes.

[As in] I can learn anything. I'm a fast learner.

Right.

So you saw mining [as] a learning curve of how to do underground testing, then, with those tunnels. What were some of the first tests that you saw?

[It] was in E Tunnel. It was right after an event they called Rainier, and of course there's much discussion about the tunnel sections going in to where the first experiments were, you know. I'm telling you about these flat backs, and there was a change that was coming about *very* quickly.

Well, it sounds like they did have safety concerns once it was brought to their attention and they couldn't ignore it.

Well, not only that, and a person that was killed, you follow me?

Yes. That's very drastic.

That sets a precedent, and [gets] attention. But it took quite a while for an underground capability. I'm talking about qualified miners that understood the basic requirements of mining and running different machinery. I would say that it seemed to me like it was six months or possibly a year before—and they were working on a three-shift basis seven days a week—to get people that were qualified in all those areas, doing all these things.

Did you see the qualification rise, then, that they got better? They got up to standard?

Oh, yes.

Did you say it took about six months to get them up to standard, or was it a year?

Well, some came out there worked there a week or two or three and left. You know, you had this—

Turnover.

Oh, yes, *real* turnover, because of the location of the site.

The commuting? You're talking about the commuting? The long days—

Yes.

That it was hard work, long days?

Well, no harder than normal mining, but where the people were assigned to stay was in Area 12, [00:50:00] which is about forty-five miles from Mercury, and that's where the crafts stayed.

There was a few that drove, you know, in salaried positions, where they had a vehicle to drive into Mercury. But you see Mercury itself was a situation where they had a large dining room and they assigned rooms also to people. I don't remember exactly. I think it was about eight dollars a week.

[Sound of someone knocking on the door and ringing the doorbell]

Who is that?

[00:50:42] End Track 2, Disc 1.

[There is nothing on Track 3, Disc 1.]

[00:00:00] Begin Track 4, Disc 1.

[Interruption due to problem with recording equipment]

OK. Did you get to go to Amchitka? [for Cannikin.]

Yes, I managed Amchitka.

Tell me what you remember about it. Amchitka was up in Alaska, right?

Yes.

And it was extremely deep.

Six thousand feet.

Six thousand feet. Oh, my goodness. And that was in 19—was that '81?

Seventy.

It was '70. 1970. Now I understand that it was very, very hot down below.

Correct.

And in fact Hank Peluaga, I think, talks about the shaft that went down and how long it took to get down. Now did you spend time going down or did you just spend time managing it?

No, I always made a habit of at least, whenever possible, going into the operations at least once a day.

Once a day? Now those were difficult working conditions, wasn't it?

Well, let's say unusual, you know, because of the heat and the water conditions.

Well, it was like 130 degrees?

No, it was about 122, as I recall.

That's still quite warm. Now there does seem a necessity for drinking Gatorade. Was the Gatorade to kind of keep you hydrated?

Yes. Not only that, to keep you somewhat up in your calories.

OK, because you were burning calories. Now I understand that there were a lot of challenges to Amchitka, to doing that particular shot, and the drilling was probably the—

The drilling was done by a contractor long before we went there. I went there along with four people. Hank Peluaga was one that I took with me because the job was at a standstill.

Oh, what had happened?

Well, what had happened is the inflow of water had increased slightly. You have got to understand there's two deep well pumps in the sump, and as the water accumulates in the sump it also takes down silt. That silt cuts those impellers on those pumps and they begin to lose their capacity.

To pump.

Yes.

And that pumping had to go on constantly because you would come up against so much water.

Yes.

Now clarify for me, was Amchitka in the ocean?

No, it was on, a volcanic island in the Aleutian chain. It was just another island.

OK, so it was on the island and you were going down into solid material.

Yes.

But you were coming up against a water table?

Well, not water table. The water table is the first fracture—you see, that mining area was possibly 150 feet below the ocean level, so all of the fractures that you have in these holes would discharge water because of the pressure that you had from that height.

Just from the ocean itself, whatever creeps in crevices?

Yes.

So that had to be constantly pumped out. And if the pump didn't work, then it would start to fill up.

Yes.

That was dangerous, then.

Well anyway, there was a problem I'll tell you about. As this water increased, the more often those pumps, one of the two that would have to be replaced, and a reconditioned or a good pump [00:05:00] put back in. That had to be done as quickly as possible. That was happening about every third day because of the wear on the impellers.

And you said the silt had something to do with that?

Yes, that's what caused the major part of the wear. The problem really was the fact that initially when that operation was planned they get hydrologists and engineers and everyone else to plan these jobs out. Well, one area that they completely overlooked was the effects that the increased inflow of water would have on the pumping system that they had designed, which was not enough. Well, every time a pump had to be replaced, the rest of the operation shut down, so that meant that every other day or so was lost to the mining cost.

So it was costing them more money than what they anticipated.

Yes.

So that's probably why it shut down, then, wasn't it?

Well, it was at a standstill for a while, and when I went there first as a consultant to view what the problem might be or what it might take to correct the problem. I'll tell you about what was done, was that a triplex—you know what a triplex pump is? It's got three pistons in it.

Independent of the pumps that were in the hole [a triplex pump] was put in there. Carbide seats and glands were put in this triplex pump to withstand this wear that I'm telling you about. And when that pump was put in and [we] started using the triplex, we didn't have to pull those pumps out anymore, so they actually had a good working day and week. That was an oversight on the hydrologist. The inflow of water through cracks and crevices had gotten up to a point where it was slightly exceeding the capacity of either of the two pumps, which meant that when a pump was removed to replace [it], the water inflow would keep coming up because the one pump that was in there—

Wasn't enough.

Correct.

So it sounds like you solved that problem, then.

Right.

Now that's kind of a problem of the difference between the design and the actual implementation, then. That's an example of one of the problems that you come up with.

Right. But you will run into unusual situations, you follow me? Unforeseeable. But no one thought about that. But you see, with its depth, as I recall, the water pressure, the inflow, was about 128 psi [pounds per square inch] and that's quite a bit. So anyway, after the mining there was the removal of all the necessary rock and the cables put in. There was an adjacent drill hole, smaller diameter, that a pipe and the cable to operate the pump I'm telling you about, the triplex, while they're getting prepared to close it for the experiment, you follow me?

Now most of these experiments had one hole, is this right, for the device, one hole for measuring the cables?

No. The same hole.

The same hole did both. But in this case you needed a separate hole for the pump?

No, the separate hole was drilled and planned that during the button-up or the sealing-off while [00:10:00] that hole has to be stemmed, that there's a place for that water to go. So the triplex pump is pumping then; instead of pumping out the main shaft, it's pumping up the pipe in the drill hole.

OK, so it's pumping the water—it's pumping a different route?

Route. Correct. And being pumped by a pump that can withstand the wear of silt. But with the carbide that was used in the valves and in the glands, it cut that wear down to almost zero.

So the triplex and the carbide—so they used a sharper metal and then the plex.

It wears much better. It wears like forever compared with steel.

So they didn't have to replace it?

Correct. The parts. So when all of the necessary work had been done as far as the experiment was completed—placing them in the hole, the main shaft, pad, and area where a bulkhead was placed to stem up the main shaft, and that was done – the experiment was very good. It was a *very large* experiment, at that particular time possibly the largest the U.S. had detonated. You're talking about fourteen, fifteen megatons.

That's probably why they were doing it there in the first place, wasn't it?

Oh, yes. And that location is located about six hundred miles west of Russia [Union of Soviet Socialist Republics, USSR], to give you some idea where it's at.

Very close.

Oh, yes.

I bet they were nervous. I heard about the protesters, the Greenpeace, that it drew a lot of worldwide attention.

Oh, yes.

Did that interfere with your work?

No, it didn't interfere. It didn't benefit any, but it didn't interfere. They understood that if their pursuit in anyway interfered with the work that was in process, then you had the right to remove them.

Now how long did it take to prepare Amchitka? How long did you work on it?

I'd worked there six months. Well, there was a company that—Peter Kiewit had the contract to do all of this except oversight or otherwise. They were flooded out twice, and that time was lost, you know, recovering the shaft again from water. That's why when I went there and looked the situation over I said, You know, there's got to be some drastic changes here. That

triplex was put in there which had the capacity for about ten gallons of water a minute more than was inflowing.

That was a big change. And then plus not having to replace it every day.

Correct. So anyway, when that was all done the necessary bulkheads were put in and the shaft was stemmed and they had the detonation. The experiment was conducted.

Well, let me go ahead and—

[00:14:20] End Track 4, Disc 1.

[00:00:00] Begin Track 2, Disc 2.

OK, you just said that there were no women on that island. Tell me that again.

No. There were no women *allowed* on that island, and that happens throughout Alaska on many of the outlying jobs.

Now why was that?

Well, because of the influence that they have on the male.

Distracting?

That's the best way to describe it. There were women that held high positions in some aspect of that experiment that were allowed to come on the island and look the operation over and normally spend a night or two on the island. And there would be a nurse in attendance, and again that for the same reason that we talked about, you know, why women weren't [allowed]. To me it was a little unusual, but to those miners that were working there, Alaskans this is, this is the way all of the outlying jobs are in Alaska. And the reason for that is because of the problems that result from women being out in isolated areas with large numbers of people.

Boy, they sure can't enforce those kind of rules nowadays, can they?

Things have changed a little bit.

Sometimes solving one problem creates more problems, doesn't it?

Right. Every time that a problem, a serious one, is solved, there is other effects that it has. You couldn't describe them as serious problems, but they are. In other words, the major problem was not 100 percent completed, 100 percent meaning that all other problems that result from that are taken care of. Do you understand what I'm saying there?

Well, in my mind I'm thinking about how the changes took place in the military, and that there are some very, very male-dominated industries. That's actually what is going through my mind, you know, but you're talking about industries where there's a lot of isolation. But in with males and females in combat—

That has just come about in the last ten, fifteen years.

Yes. By trying to solve certain problems, there's others created, and you're saying that there were certain restrictions that were put into place because they were trying to prevent a bigger problem.

Correct. And [what] I've often thought about is, that women now going into the military where there is one or two in an area, somewhat isolated, where there is fifty or a hundred people, there is *some* effect that those women have, you know. Human nature.

I think that's an interesting observation, that it's good for you to make that. It's good to think about it.

Oh, yes.

And how you saw that first-hand back in 1971. That was one of the effects you were concerned about.

[00:05:00] Yes. We talked about it, you know. The Alaskans, so to speak, people that were raised or had worked in Alaska were familiar with that ruling. Now people that were coming in

from the United States out there would raise the question, how come there's no women here? Oh, it enters the picture. That's just human nature, you know?

Yes, Alaska has a lot of oil drillers, a lot of oil platforms, and it's a very male-dominated industry.

Yes. They have the oil pipeline maintenance. Interesting you raise the question. The oil pipeline, you know, the discharge of that oil that's being pumped, that pipes that oil down to the coast, you follow me?

Yes. The pipeline. It's called the Alaska Pipeline.

It has maintenance stations about, I've heard, you know, different distances, and the reason for that is because it's got to be under observation, that these locations, they're like inspection stations. Now the people in Alaska, and I said "people," the oil people that's been associated with programs like that, all look for that job. There is a building like every fifty or so many miles, and that individual's responsibilities are to inspect that pipeline to make sure that there isn't a leak or something that's going to result in some serious problem, because whenever that oil stops flowing through that pipeline, you're talking about many, many dollars.

And if there's a leak or contamination, then you've got more problems.

Oh, yes.

So you learned something interesting about Alaska during that time.

Yes. I had never experienced that before.

Was that your only trip to Alaska?

No. I had been in Alaska on several occasions, but on just a trip. To go [into the] interior.

Knowing people there, to go see them and visit with them. It was interesting to me in several ways. There was a valley about fifty miles out of Anchorage. I'm trying to think of the park.

Well, there's Mt. McKinley.

McKinley. There's a train. It's a state-owned-and-operated train that operates from—I'm trying to think of the city beyond McKinley.

There's Fairbanks.

Well, it could be Fairbanks. But that is a state-owned train and state-operated train, and just religiously the hours are the same. Something interesting about that train is that there are a lot of Alaskans—I say “a lot,” you know, the number isn't going to be a million but these are people out of Anchorage that want to go out and spend a week or two or what have you out in a certain part of Alaska. They will ride the train and they will tell the conductor, I want to get off, at a [00:10:00] certain point. Then on the way back, same way, here would be a guy that'll have a bed roll and the old train comes to a stop, picks him up, takes off. These are major trains, both freight and passenger. And of course newcomers like myself, the first time I was on it, says, what the *heck* are we doing here, you know, stopping? And so he goes into this, telling me about Alaska, you know. He says, You know, there's a lot of people that come out and spend a number of days out here, and you seen them all getting off at creeks. Now you know of course fishing, I'm sure, is one of the parts of their little journey out there.

Yes. Fishing and hunting is big. Salmon fishing. Yes, very, very big. So Las Vegas is a long ways from Alaska, isn't it?

Yes, it is.

Now we had Baneberry about that same time, too. Did you participate in Baneberry at all?

No.

You didn't. But you said that the hydrologist had to learn a certain lesson with Amchitka.

Yes.

And the geologist—

[00:12:04] End Track 2, Disc 2.

[00:00:00] Begin Track 1, Disc 3.

OK, you were just telling me about Kellogg, Idaho.

There was a time, you've probably heard about it, but they had a fire underground in the mine in Kellogg.

OK. Now was Kellogg part of DOE [Department of Energy] labs or DOE—?

No.

OK. It was just a mine.

Just a silver mine. But this was not uncommon, where the DOE if in any way could be of assistance or helpful to these problems, they would immediately, willfully do this.

Oh. This is a new area.

No, that's—

For me. For me this is new. This is not new to you but the fact that they went out and were on call to help with problems that were unrelated to testing, you know, this is—yeah.

But anyway—

So you got called to that, to help with that?

Yes.

Do you know about what year this was? Seventies? Eighties? Don't have to be specific, you know, just general.

In the early seventies. There was a situation there where there was a fire that started in this underground mining operation where there were a lot of cables and other objects that burned in this one tunnel section above the main working area. The ventilation system in that mine was so installed that it circulated the ventilation that went through this tunnel section where this fire was

at. But anyway, and went down into the lower tunnel section. Well, that smoke, and I'm talking now about the effects that that had is because we're talking about carbon monoxide, it actually killed a hundred people.

Oh! Oh, that's terrible! All at one mine?

Yes.

Oh, that's a horrible accident.

Well anyway, when I went there, I was asked again by DOE to go there to see if there was some serious problem that might be taken care of and to help them get operating again. Well, when I went there I put a hoisting system into operation through a drill hole that went down from the surface down to the area where these people—you know, heck, they didn't know it. They were just laid out various places from the gas. Well, there happened to be *one* man, after we had put this hoisting system to remove, you know, whatever, to transfer us down to that level—

Did you have to have gas masks on to get down in there?

Oh, yes. You didn't *have* to have them, but it wasn't known at that time, you know, and of course you kept monitoring for gas. When the conveyance, the man hoist, got to that level where these people were, you know—

Dead?

—were gassed, here was one individual near that shaft—

Who was alive?

Yes. The *only* one. And of course the question was asked, where in the hell were you at when all of the—? You know.

When all these others—

Well, I was off over here in this area, completely out of the route of that ventilation that was coming down, you know, where these others were working in the main area where the main air flows were at.

And that's how you found out what the problem was. Was that how you found out what the problem was?

[00:05:00] Oh, you could tell immediately. It doesn't take very long to suspect something of that nature. The first thing was that fire up on the second level that was flowing down below. We heard about the fire and what it was in. It was burning a lot of cable in with rubber and—

That would create the carbon dioxide [monoxide] and that would go into the circulation system?

Yes. But real thickly so that the ventilation was actually poisonous. Of course those people down below, this tunnel section down below where these bodies were at, was possibly three hundred feet below where this fire was at, you know, and they wouldn't know that the fire was up there except that it should've been detected by smell. But in the area where these bodies were at, there was an area about five hundred feet in length from where we went down, you follow me, to where the main hoisting system was used to hoist the ore. And the bodies were laid in different areas, and the question was, have you ever seen anything like this? Because there was some sitting, the majority laying down, but none of them looked like they was in pain, period.

So it looked like it was undetected and they were going about their regular business and were caught unawares.

Right.

They didn't even know what hit them.

Correct.

Oh, that must've been—

The surprised look this individual had, and he says, How come I was where I was at and out of the flow of the main air stream? Well, I guess the grace of God or something.

Yeah. Yeah, that was a miracle, wasn't it?

I know when I went down, he come out of the shaft with me and he says, You know, I'll never forget this, of why I was exempt from all of this, you know. Because as we walked through, there was bodies there. They hadn't started recovering—well, they had started removing bodies but there was just so many that they could take to the surface.

Oh, that must've been such a shock to him. These were his fellow workers, his buddies, his—

Oh, yes, but that's not unusual. That has happened in a number of mines. That gas.

Were there other experiences that you had being called as a DOE person to help industry, miners?

Yes. A gentleman that worked for the Safety Department in Reynolds [Electrical and Engineering Company, REECo] and I was called up to Hanford [Works, Washington] at one time, where they had started an underground operation, to evaluate the operation underground to see if it was being done safely. Now this is the DOE merely telling REECo, whom I worked for, we want so-and-so and so-and-so to go up there and evaluate and give us a report.

And so you were called to do that.

Oh, yes.

And what'd you find?

Well, we found that some of the areas that they were working in, working in unsupported rock sections which is very highly fractured, and there was large rocks that were dropping most of the time. It's just a matter of things being right until there's a man, you know. So anyway—a

[00:10:00] *Do you feel like the mining that was done at the test site helped the mining technology outside of the test site, then?*

Oh, yes. Oh, yes. There were different operations that was done, and this is underground at the Nevada Test Site, that were not common to normal mining because the need for that did not exist in conventional mining.

Does that mean that in the process of doing that unconventional, that you learned some high technology things?

Correct.

I know that was true about drilling, too.

Oh, yes.

Yeah, when the Soviet Union could compare their drilling technology with ours, that this was an area that we were very good. We had some experience they had not had.

Right. Did someone tell you about the Russian group of drillers that came to the test site and were at the test site about two weeks observing a drilling operation?

I've heard about the Soviet scientists who came in 1988 [during the Joint Verification Experiment, JVE], and I believe that's part of what they were doing. Did you get to interact with them or show them or anything?

No, I wasn't—you know, you'd talked about Larry Neese. Well, Larry Neese was responsible for that drilling operation that this Russian drill crew spent the better part of two weeks on. You know, people were kidding the drilling force on that rig, Hey, have you learned to speak Russian yet? Well, not strange, but these things happen. Other than "hello" was about the extent of the English that those people knew.

Oh, of the Russians.

Yes.

The Russians. Well, they had translators.

Well, there was one that was with them all the time, and of course he'd just get a big kick out of it when somebody would hear a word and this individual would keep saying that word, this translator would ask him, Do you know what you're saying? [And the individual would say], No, but it sounds like I should.

Well, when did you find out that the Russians were surprised at the American drilling?

Well, that had been talked about for quite some time, that the technology that the Russians used in drilling and our technology differed because, number one, they did not have the most up-to-date equipment like we had at the test site.

Well, the kind of drilling they had been doing was also—the geology was a little different. It wasn't as—

Well, just being in a different country, instead of the granite which is common in all countries, but then there's the limestone and what have you. It was interesting, you know, to listen to these Russians as to—and I'm talking now about the drill crew, through the translator. They would see a piece of equipment but they didn't know how it related to the drilling operation, so through the interpreter, you know.

And we're expected to drill that hole with what?

Yeah.

I didn't know at what point that the Russians said, We can't drill that hole. Troy Wade said they said, We can't drill that hole.

Well, they didn't have the tools to drill the larger holes. You know, that is an area which was developed at the Nevada Test Site.

Big-hole drilling?

Big-hole drilling. But there was a period of time in which this came about. Initially with drilling, [00:15:00] when they started drilling for testing, the largest hole that they could drill was thirty or thirty-six inches. The *reason* for that was the size of the drill pipe and the weight that they had to have on that bit to cut the rock. And how it affected the drill pipe was that it would torque up by the weight that you put on the bit. So the size of the drill pipe had to be changed. This is a process that requires time because you just can't go out and get this stuff off the shelf. They went from a six-inch drill pipe to an eight-inch. Well, the eight-inch had the same problems but its capacity was greater, but yet it was not great enough to do the things that they wanted, like going from thirty to thirty-six inches with a four-inch, probably go to four feet with the eight inch, and the same problems, you know, when you put the weight on and start turning, you start torqueing the pipe up.

Tell me what "torqueing" means.

As you twist something like pipe or a bolt, in putting it into something, as you tighten it up, that's referred to as "torqueing."

OK. Is it kind of a screwing effect?

Yes.

OK. Circular?

Yes.

OK. I think I've got a picture now.

Eventually—now this didn't happen overnight. Took about three years for this to come about, going from the six-inch pipe to the eight-inch pipe, and with each increase in size, they could increase the size or the diameter of the hole. Well, after about three years, what happened was

that they were—see, it takes about the better part of a year to get this equipment because it isn't a shelf item.

It demands special manufacture?

Yes. Like today the big hole drilling, the drill pipe is thirteen and three-eighths in diameter. The diameters that proved to be the most efficient was ninety-six and 120 inches. Now you're talking about a large diameter. You're also talking about the bit that does that drilling—

I've seen picture of that. I went out to the test site and saw that. Huge bits.

Oh. But anyway, then the weights. You see, a drill string, before it starts drilling, loaded with the weights and everything on there, would weigh somewhere between ninety and ninety-eight thousand pounds. So the drill pipe has got to have the capacity plus the strength to withstand the torque.

That circulation.

Right. To cut. But anyway, those things just don't happen overnight. This is over a period of time.

Now you got to see that, didn't you?

Oh, yes.

You got to see the development in different stages to the point that it arrived at.

Yes. And there were different techniques that were developed. These holes that were drilled had to be, or they were desired to be, as straight as possible because of the packages, and I'm talking about the experimental packages that went into these holes. Well anyway, there were techniques that were developed on how to keep those holes as straight as possible. Now initially you start out and you just drill at random, you know, and the bit'll go wherever.

Well, I understand the geology of the Earth is not straight down. It's not natural. It curves. And so if you just drill, you will follow the curvature of the Earth. And that it takes a higher technology to resist those curves and to go line-of-sight straight.

Correct. All the way down.

[00:20:00] *Well, I guess they call it "plumb."*

Plumb. Yes. But the thing about it is, is that all of that, what we talked about here, [was] to develop in six, eight years, you know. Number one was to determine the need and justify the need, because you're talking about large amounts of money when you start buying new equipment like that. My son works at the test site. He's the crane general foreman of the operators. I ask him about what have they done with the drill pipe and the bits and what have you? He says, I couldn't tell you in total. There's bits and pieces here and there. Well, that's a shame to me because of the problems that were related initially acquiring that, you see, and the drill rigs have got to also be designed and pieces such as the rotary tables—this is what turns the drill pipe—and other parts must be designed to accommodate the larger diameters that are used. Well, the problem—well, it's not a problem, it's understood, it takes a period of time after an order to receive this stuff. It isn't just made overnight. And it's really, you know, now I'm getting back to asking my son about this stuff, the need doesn't exist there at the present time but who knows down the line?

Do you think that there's knowledge getting lost? Is that what it means to you?

Well, not only knowledge getting lost. It is [that] the equipment to *do* that type of work is not being maintained. You see, there's a different contractor at the test site, and of course from time to time they're asked by the DOE, we've got to have a scrap iron drive. Well, a lot of these parts and pieces go *into* that. Really a shame.

Do you think that affects our defense readiness?

Well, there are, I shouldn't say "plenty," but there is a number of large-diameter holes that were left over from the drilling program that were not used by the laboratories, some eighteen or twenty. Well, eighteen or twenty, when you look at that in regard to the experiments that could be conducted, is about two years' testing. But you have a period of time there that all this other stuff has got to be made available. Boy, the money that that stuff cost. Poured out. A string of drill pipe, you know, four thousand feet, eight hundred thousand dollars. None of that stuff comes cheap. Those drill bits, the large ones, you're talking about a couple hundred thousand dollars for a bit, because it isn't something that's already on the shelf. Those pieces have to be cut out and welded and everything has got to be done *accurately*.

And that was contracted out to somebody else. It wasn't anybody at the test site who did that, then, who made that?

No. Well anyway, what I'm getting at is the contractor that's out there now has never done any [00:25:00] of that big-hole drilling. Whenever I see people like Larry Neese and some of these others, you know, the question will come about, what would they do if they had to go back into that? I says, well, hard telling what they'd do. They'd go through a very difficult period of time getting the stuff they have, yes, the design I'm talking about, on paper, that they wouldn't have to go through, you know. But the manufacturing and the fabricating time—

That's more timely, isn't it?

Oh, yes. Did you speak to Larry very long?

Yes.

He was pretty interesting to you, huh?

He had a lot of pictures, lots, and he's a genius.

Oh, yes.

I had great respect for all of the different—there was at least a hundred photographs of drilling through the years, and then he had some other—he kept a journal while he was over in the Soviet Union. He had a bottle of Russian beer. He had picked up a couple of Russian made-in-the-USSR tools while he was there at the site. So he had a lot of interesting things to say about drilling that he had been in and also his career. So yeah, I enjoyed it.

He's been in drilling all his life. He was a very, very talented manager, Larry was.

Very careful. I was impressed at his safety record. I think he was very proud of it.

Oh, yes.

Yeah, because he has all of his fingers, too [laughing].

Oh, yes.

Yes, he believed in being careful, to take his time. Yes, I got to talk to him and Donna both.

You know, speaking of that, speaking about physical condition, since he had that stroke it had changed a lot. He was always very active, you know, a live wire. Now he doesn't go anywhere without his wife.

Yeah. Yeah, it slowed him down. But his mind is very bright.

Oh, yes.

And I was grateful that he shared with me what he did. I've learned a lot. And they've donated a lot of their artifacts. They've talked to their kids and the kids said it was OK, they wouldn't know what to do with them, and so they donated their artifacts, and I've read his journal, read the experience.

Now you said that you were on the list but you didn't get to go [to the U.S.S.R..]

Yes. Let me tell you. There was a question as to whether Larry should go or I should go, and yet I was the manager of the drilling department on the test site. They said, Well, who's going to replace you? So anyway, we were conversing each day on the phone about needs and done very well. Everything that they needed was flown to them, you know, it wasn't—

So you talked to Larry, or did you talk to Guy [Gylan] Allen ?

No, talked to Larry.

You talked to Larry!

Oh, yes.

Ohhh! Do you remember anything about what he needed or what he thought of what he was seeing?

No.

He's a man of few words, isn't he?

Yeah. The thing is that they were not drilling as fast as he expected and wanted to. Initially when they went there with the tools that they took from the site—see, the drill rig and all the tools were flown over there—the drill bits were not the right ones for the formation.

Ohhh, they hadn't determined that beforehand, then. It was only once they were drilling it that they realized it was the wrong—

Right. You see, none from the test site had ever been there. So anyway, they were drilling about **[00:30:00]** three feet an hour, which is not very much or good for a drill rig that large. We had talked about that and I explained to him, I said, I think you should try a carbide button bit. That way you can use a little more weight and maybe rotate a little faster.

Now carbide, is that what you learned from Amchitka, then?

No, carbide was used here for different things, and carbide is used in bits for durability.

So we talked about that and he says, well, he says, I'll tell you what, it's sure worth a try. Well, send me two of those bits.

And boy, about three or four days later he says, We are constantly at five feet an hour, Frank.

Well, I says, maybe there's a chance for you to get the hell out of Russia one of these days.

Boy, he says, I hope so.

He wanted to come home, didn't he?

Oh, yes.

He said he was there eighty-nine days too long [laughing]. I thought I had read that he had said, I talked to Frank Solaegui. I think in his journal—but I had assumed you were in Russia. I had assumed you were there.

No, I was here at the test site.

You were on the phone.

We had a particular time that he would call or I would call, and that was so we knew where we were at and the importance of the call because of the needs.

Yes, you tried to be very responsive to him, didn't you?

Oh, yes.

Well, I've been confused at, you know, there seems to be a lot of communication going back and forth. The team leader was sending reports daily, but he doesn't really discuss what Larry's concerns were, so it sounds like you dealt with the drilling details.

Right.

And Guy Allen wasn't a driller, and so he just dealt with maybe supply issues and communication issues and some other things.

Correct.

Well, it's interesting. It's interesting because it's such a complicated thing to have accomplished.

Oh, yes.

How did you feel about the Soviets coming to the test site? What did you personally think?

You know, I personally thought there would be a lot of benefit that would come out of it. Not ever being around Russians, especially that didn't speak English, that were, you know, bilingual—

You had a curiosity, then, about what it would be like to see your counterparts?

Yes, and what their comments would be to the different phases of drilling that they were observing, you know, whether it was the same or what differences there were. Also the tools. And they spoke very openly, but in Russian, so everything—this translator, he just kept going [laughing].

Yeah. Now were you aware of when the drillers painted some of their tools and part of the drill red, white, and blue? Were you aware of when that happened or who did it or—?

I remember hearing about it and the effects that it had.

What were the effects?

The effects was, what the hell did they do that for? Because you know they might not take this too well, having U.S. colors on there. And the question was asked, a couple of these Russians, you know, well, what about the colors on there? He says, Color them any color you want, it doesn't change the metal a bit. But it was different. They would prefer that their tools not be touched. Everybody has their likes and dislikes, you know.

So the Russians didn't want their tools touched, is that what you're saying?

[00:35:00] Well, they would prefer them not being painted. It was the *paint*, you know, it wasn't—they had to have their tools worked on.

Oh, I see. OK. Did they realize it was an expression of patriotism by the Americans, and maybe a little bit of protest?

No, no, no.

It didn't occur to them?

Right.

Now what did you think when the Soviet flag was lifted at the test site?

Well, that was expected. That didn't surprise me.

Oh, that didn't surprise you, either!

No.

Oh, OK. OK. Did it mean anything to you when it got raised?

Other than the fact that there were Russians present.

Did you hear about the United States flag getting raised over in the Soviet test site?

Yes.

Did you hear a lot about it?

Well, no one thought that that would be done, nor should it be done, another country's flag going up, you know. But being in the location that it was, it was just like the Russian flag here. It didn't bother me a bit. Hey, here's some Russians here. So what's a flag going to hurt?

Yeah. You probably didn't want an international incident over anything.

Right.

But if they were OK, then we were OK. Has it become more significant to you with time that that was the end of the Cold War right there, when they came, when we did that exchange?

Well, yes, there was a significance to that for the simple reason that had been talked about, these countries, you follow me, that are trying to develop drilling like we have here, should visit the test site. Well, there are other facts that are involved with this, you follow me, diplomatic and—
Yeah, that [would] make that difficult to do.

Correct. But no, it's funny that you raised that question about the flag. At the time I was a division manager of the Construction Division. When I went out there the driller was telling me, Where do you suppose that guy keeps that at night? And there was another driller that was standing by that says, You know damn well that he uses it for a pillow at night. They wouldn't trust it being out there, you know.

The Soviet flag, is that what you're saying?

Right.

Oh, he used that as a pillow. He protected it at night. Oh, that's funny. Oh, that's funny. I haven't heard that one. That's really cute. That's really cute.

What's the highlight of your life?

I've never really given it much thought. You know, a particular area that I was really interested in—I was a paratrooper during the war—was parachuting. I really liked that. There was a friend of mine that almost always when we were jumping he was always around. He used to say, What do you think we're going to use for a profession when we get the hell out of here? I often thought about that.

Well, there is something in common, you know, being—mining, and this is something that Marv [William] Swena—I got to interview him—he said, I've always liked living life on the edge. And being a miner, there was something about being on the edge. It was kind of, you know, there was—your life was always—you had to be very careful. And being a parachuter, same thing. There's kind of an edge there. Do you think you kind of liked that, the edge of—?

Yes. There was something, also you know, you really liked it or you didn't. There's no halfway about it.

[00:40:00] *Do you think the miners probably exposed themselves to more danger than anybody else did?*

You know, I've heard that a million times. My opinion about that is it's as dangerous as you allow it to be. The individual is responsible for a certain amount of that safety. Of course, all the areas and these operations that I've worked on, we always had a safety meeting in which we discussed these things. That was primary, you know. Whenever you see anything that you dislike for some particular job-related problem, you talk about it.

How often did these safety meetings take place?

Well, normally they took place every week, but the one that I spoke at, I normally wouldn't do that. The bosses off of that particular crew, you know, because, these crews are rotating and there's only one crew. But they can either be beneficial or of no value, and it depends upon the individuals that are involved on how they're accepting what is being said. And you will always find some that'll say ah, that. Ah, that. We talk about it.

And they're going to ignore you.

Right.

Did they last very long?

Oh, yes. You couldn't just tell the man, I don't like your attitude; I'm going to have to turn you loose. That's not a justified reason, as long as the man is doing his work and doing it safely.

Now how was your relationship with the experimenters? The lab.

Good.

You had a good relationship with them?

Oh, yes.

Did you? Was there one lab you preferred over the others?

Yes. That was the Livermore lab [Lawrence Livermore National Laboratory].

You liked Livermore. Why did you like them?

Well, I'll tell you why I liked them, is the fact that they were more helpful in your needs, more open to discussion about the work in process. Los Alamos [National Laboratory] was one that was closed in some of those areas, you know, like you have no need for that information.

How about Sandia [National Laboratories]? What did you think about Sandia?

Sandia was good and, in my opinion, mediocre. There were times when they had good, intelligent, knowledgeable people involved with work in process. There were other times, it was just like the miners I was telling you about, they'd just go get these people off the street that did not understand what was [what], you know.

Well, it's nice that you felt really good about Livermore.

Why?

Well, because again Marv Swena was talking about how sometimes the scientists, the experimenters—well, he said they didn't want to sign in and out when he had to clear the tunnels, and he'd have to re-walk the tunnels in order to make sure everybody was out. He kind of felt like they would want to keep working even though there was a certain quitting time, and he had some interesting things to say about some of the lab people. I was just wondering if you had had any experiences.

Oh, I've had some experiences along those lines. I think you can always find some people that [00:45:00] are a little bit averse, you follow me, to the program or what you want them or you'd

like to have them do, that have opposition to it. Livermore was not like that. Livermore was just like one of the crew.

Kind of like you felt like they had respect for the craft.

Correct.

Well, it is a team effort, isn't it?

Oh, yes.

They may come up with the ideas and the plans, but whether or not it works according to plan is another problem.

Yes.

Let's see. What was the most difficult time of your life?

[Pause] Are you talking about—?

Career.

Whatever?

Yes, whatever, you know. These are kind of looking back, your opportunity to kind of look back on different things.

[Pause] You know, the one that possibly I think about more is the loss of my wife. We had been married over fifty years.

That's a big one.

There were certain jobs, certain aspects of certain jobs, you know, that you might not like but it was achievable, you follow me? But I can't remember—I don't remember anything that really seriously, you know, gave me problems like that.

You had a lot of satisfaction in your work, didn't you?

Oh, yes.

You did. [Pause] Took a lot of pride in it, doing it well. When did you retire?

In '91.

That was just before they stopped testing, then.

Yes, I'd, you know—

Could you see it coming that it was going to be finishing?

Well, I could've continued but I told my wife, I says, Come July 1, I'm hanging it up.

Well, you got to spend nine years with her.

Oh, yes.

Nine extra—that must make you—I'll bet you're glad you did that.

Oh, yes.

Was your work hard on your family?

I'd have to say yes. They didn't speak of it much.

Were you able to talk about your work at all?

Oh, yes. My wife used to like me to tell about certain oddball experiences, you know.

Yeah. So you could share that with her.

Oh, yes.

Yeah. Now when you worked for DOE, were you able to stay in town more?

Well, I always stayed in town, you know, unless I went off to another place, period. I never had any problems working with DOE. [Pause] They always give me the impression that, Yeah, we'll tell you about it, but go on ahead and do it and then let us know how it turned out.

Well, it sounds like they gave you a free rein.

Oh, yes.

That's good. Just solve the problem. Well, it sounds like they trusted your judgment and—yeah.

Now you had said something about other aspects of mining and drilling that were outside [00:50:00] of the test site. Did you want to talk about that at all? You did a little bit, with Idaho.

Well, when you talk about the mining on the outside, the area, and I'm not just talking about general mining because there are set, established methods and procedures that get established in a mining operation. It's just that way by nature. That's brought on by the supervision.

No, I never really had too much problem, you know, with others that I was working with or working for.

Sounds like you generally were able to get along with the people you worked with and for.

Oh, yes.

Any that you especially liked? I know you liked Larry. Kind of related here. And Bill Flangas has a great deal of respect for you.

You know, Bill, that's an important or interesting subject. Bill does not have a good mining background. When I first met Bill, I was working for a company. I was the shaft superintendent, and this was in Ely, Nevada. *He* had just gotten out of school. And we'd had our trials and tribulations.

He had just come out of school and he says, That's not the way we're supposed to do this.

I says, I'll listen to you, but let me tell you something. Unless what you're suggesting is *proven* to be the *best* way to go, hey—

[And he says], But you're not accepting what I'm saying.

I says, Are you sure what you're saying that you really understand the effects, you know, what have you, that it might have?

You were talking about another person that you had—Troy Wade?

He started out as a miner.

Yes, I was going to say that. We worked at the *same* tunnel.

Did you? Tunnel E?

E. Right.

E. Back in '58.

[Fifty] eight. Right.

Was he a tunnel walker then or was he—?

Yes. Tunnel walker.

And he was also a, what do you call it, explosives man. He said he did explosives, too.

Oh, yes. But he had transferred from REECo to Livermore, you know, is when he pursued increasing his knowledge or developing it further with the handling of explosives. That's explosives that are associated with the nuclear experiments.

Yeah, he got to do a lot of things that he didn't expect he would get to do.

Do. Right.

Going to Washington, going to Geneva. Interesting, starting out in the mines in Colorado. You know, it makes you think that this is America where a young miner from Colorado can go to Washington, go to the Soviet Union. You know, it's really sobering.

You see, I encouraged that, but let me tell you something that you've got to understand how those things come about. Most often there is *someone* or several in those areas that would like to have you, and it's by their strength that you get there. It isn't because of your superb knowledge [00:55:00] or what have you. Maybe there's a particular area that they want to chew on your ear about, you know.

But he certainly got a remarkable opportunity. Jim Magruder also talked about the many different opportunities that he got, starting out as an electrical engineer and then a lot of experiences. Very, very remarkable.

Oh, yes.

Yeah, the test site has been an interesting experience for a lot of people. Very meaningful.

Including myself, you know. I done a lot in mining there in developing a procedure, and I done that also in drilling, and it's those things, to me, that make you feel like you really contributed something.

Yes, you made a difference, because it's still being used.

Right.

Yes, and a lot of lives were more safe as a result of those procedures.

Yes.

Well, if there's anything else you would like to add—you've answered my questions.

No.

If there's anything you want to say to anybody who's ever criticized the test site, now's your opportunity.

No. You know, not that it's a criticism, but I have some real—serious thoughts about what's happening to the test site with *all* of our changes in government and what's going to happen to the work, you follow me, that at one time was felt to be so important and necessary.

What are your thoughts on that? That's a deep subject.

Well, I think possibly that the test site or parts of it will be taken over by companies for experimenting, other than, you know, related to the nuclear family. But things have changed. I don't expect to see the underground, the mining there, ever go any further than it is right now.

The laboratories—I should say laboratory—which is Livermore or Sandia, has in the last several years maybe one small event in a tunnel, isolated. But this is in an area where the work has essentially been done.

Well, do you think they still need to do testing, I mean since the Soviet threat's not there anymore, and do you think Iran and North Korea justify it?

My opinion is that technically we are to that point of whatever they come up with could be taken care of anyway.

Do you think the nuclear threat is the same as it was before?

Well, I'll tell you something about *my* opinion about the nuclear threat, is the fact that there are so many countries that have a nuclear device or have the material to make one that the seriousness of its use, to me, has dwindled away. I don't *ever* expect to see a nuclear device dropped on any city or what have you. I just don't see that.

You mean outside of the United States?

Even in the United States.

You don't think that will happen.

No.

Why don't you think it'll happen?

Well, what would you say would be the reason for it, or the just cause? The only way that I can [01:00:00] determine or think that that might happen is if we take one of these Mideastern countries, would first drop a device on something of the U.S.'s, then the retaliation, you know, which would be quick and swift.

Yeah. Well, terrorism seems to be the most likely motivation in our day.

I'll tell you something, my opinion about terrorism, because now every country has the opposition, you follow me, and is working on that, that its seriousness is deteriorating.

But what they don't have is the financial capacity to be serious about it and then to do cleanup.

That's the one thing that they do not have, and if the Soviet Union is a lesson to anything, it's that having the nuclear capacity is not the only thing you have to have. You have to have financial resources because it's expensive.

Oh, yes. You see, that's why I say that I don't ever expect, and I could be wrong, of seeing a nuclear device, you follow me, on the shelf and all over because of the cost.

Well, I hope we never do. Yeah, I hope we never do.

Well, I do, too, you know. There was a period in time when the significance and the seriousness of a device—I'm talking about an atomic device—

Yes. Well, the Cuban missile crisis seemed to be a very, very serious moment. Very, very serious moment, where it could've happened then. But after Vietnam, it seems like the Soviets became less threatening and it was more bluffing.

Well, you take even North Korea, in my opinion, and they keep—you hear them talking about North Korea all the time. My own opinion is that they're being monitored so doggone closely, we have so much equipment in satellites and everything, there's very little these countries can do that the U.S. does not know about. And I would say that if North Korea, hey, ever bobbed, I would say it would be wiped off of the face of the Earth, quickly.

Well, it's pretty tiny Yeah, it is. Of course, Japan was a little tougher as a little tiny country than anybody supposed, too.

Yes. But you don't hear anything nuclear or a bomb or what have you about Japan anymore, do you? And I think—I'm not talking about nuclear or radioactive material. I think that's necessary in our society today. There are certain fields of endeavor that use this. I don't mean bombs.

Yes. For energy.

That's right.

Yeah, because we're depleting our energy sources.

Right.

Now you had some thoughts on Yucca Mountain, too. I think it was before we turned this on.

On Yucca Mountain, you're talking about? Yucca Mountain will one day be the repository.

Do you think the government is trustworthy, that what you have seen of the government's treatment of the nuclear program, did you feel like they did it in a trustworthy manner? [Pause] I think you have some of your doubts now, but—

Well, I'd say yes, and I'll tell you why. There are too many people associated that wouldn't allow that to happen.

There were eighteen agencies that came together. It wasn't just one.

[01:05:00] One. Right.

Yeah. Do you know when they started eighteen agencies? I know Jim Magruder said whoever set things up with these multiple agencies rather than just DOE had in mind that it would give more credibility with the public if there was more than just one entity. But I don't know when that started.

Oh, that has to go back, *whoo!* I would say about '75. There was a time, you know, that anyone in the DOE associated with a nuclear activity or device, it was even hard to talk to. It's not that way anymore.

Yeah, they're more free with information now.

Oh, yes.

Well, that's one of the reasons I get to talk to you, you know, is because there's been a lot that's been declassified.

You know, you raised a question. You mentioned something related to the test site, talking about declassified information. I don't today know, other than—and again we get to the nuclear bomb.

What would be classified? Really.

The design of the device.

Oh, I tell you what, a device—there's so many designs to a device depending upon your needs.

Well, that was kept a big secret, was the design of the device. That was what they were trying to keep away from the Soviets. But certainly not the drilling. Certainly not the mining. The crafts that got to work side-by-side with the Soviets, that wasn't classified. Probably a lot of the work you did wasn't classified. So there's a lot that isn't.

No, even at the test site—this is why I mentioned the test site when you mentioned what do you think might happen there, you know. I know this because my son works out there, and whether he should be telling me all of this or not, it's not classified. The capability, for example, the underground capability to have one shaft, which is 1-A, they have one capability crew, and what is meant by that, that if an experiment was needed, that they have knowledgeable people, you follow me, in minimal numbers, but they have them there. Sandia annually had an experiment. They've quit doing that. The tunnels that Sandia used to work in most often, hey, the tunnel is closed, period. You know, I was at the test site about six months ago. I couldn't believe my eyes. I was just really sick to see what had happened. There was a time there when the test site was maintained. Now I'm talking about the roadways. The areas there and the roads, there's thistle

this high [indicating height]. Area 12, they've moved out *all of the* dormitories. They closed up the cafeteria. There is no fire station, no service station. I'm just talking about the *changes*.

Kind of like a ghost town, isn't it?

Really! You know, there is a government agency, and I don't know which one it is and don't

really have any need to know, maybe twice a year will go to [Area] 12 and they will open

[01:10:00] up the cafeteria. There is, oh, I don't know, six or eight dormitories, and I'm talking

about wooden structures, not trailers, and prepare those that are needed for the people that will be

there, and those are the only people that can eat in the café and the only people that can stay in

the dormitories. You know, I raised the question, no service station. No, but, he says,

there's a gas truck. All of those needs are taken care of, but in a different way.

No, there's not the work population, the workforce, that there once was.

Oh, yes.

[01:11:00] End Track 1, Disc 3.

[End of interview]