

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

Interview with
Lawrence Crooks

July 21, 2004
Las Vegas, Nevada

Interview Conducted By
Robert Nickel

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Table of Contents

Introduction: birth, education, military service in World War II, marriage and family, early work in California	1
Works as mechanical engineer for California Research and Development (CR&D) and Lawrence Livermore National Laboratory (LLNL) to build linear accelerator	4
Joins Mechanical Engineering Group at LLNL	6
Becomes LLNL Resident Manager at Nevada Test Site (NTS)	8
Outlines responsibilities of LLNL Resident Manager and involvement in tests	10
Work on atmospheric tests in the Pacific	12
Involvement as scientific advisor in the Joint Verification Experiment (JVE)	14
Talks about security and clearances required for working on tests.	15
Discussion of mistakes that led to accident on Peninsula test preparation (1975)	16
Discusses work for Division of Intelligence, Department of Energy (DOE)	17
Thoughts on Cold War and work at the NTS	19
Son James Crooks and his work for REEC Co at the NTS	19
Reflects on possible reasons for strong bonds among NTS employees	20
Talks about work as scientific advisor to the Manager of the Nevada Operations Office (DOE/NV)	22
Conclusion: dangers in testing work	23

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

Robert Nickel: *OK, if we could start off just talking a little bit about your background, where you were born, where you went to school, that sort of thing.*

Larry Crooks: I was born in Sioux Falls, South Dakota. And I left there when I was a year old. My parents moved out to Oakland, California. And I attended the public school system in Oakland, and ended up graduating from Castlemont High School right at the start of World War II. And in fact I had put a year in at UC [University of California] Berkeley when the war started. And I started out in chemistry back then, but when I got out of the service three years later and I returned to the university, I decided that I wanted to be an engineer, and that might have been influenced by being in the [U.S. Army] Corps of Engineers when I was in the service.

I was a squad leader with the rank of sergeant when the war ended in Europe. I had gone over to Europe. We sailed, I think, in October after the landings had occurred in Normandy, and we spent, oh, about three months in England, learned how to built floating bridges and bailey bridges, so forth. And then when we went to—it was the 284th Combat Engineer Battalion, and we landed at Cherbourg and went to a camp called Twenty Grand that was near Rouen. The camp was above the Seine River. And we went forward after a little getting used to things over there. Participated in the Battle of the Bulge. And we were mainly being used as infantry and we **[00:05:00]** were around the Hurtgen Forest. It was a planted forest, like many of the forests in Germany that all the trees were just planted about six feet, eight feet apart. But they were all knocked down. The artillery fire mowed it all down. I was in A Company, and B Company

worked on stabilizing the railroad bridge that the Germans had neglected to get completely in the water, and so the crossing of the Rhine as we went forward, certain units went across that railroad bridge. They decked it over so you could drive across it. But there were floating bridges, and our outfit went across on one of those pontoon bridges. And then the company and battalions had been assigned certain areas to go to for the first bivouac. They neglected to tell you that the Krauts were still there. You had to push them away. And then started the work of trying to open up the *Autobahn* for use by the U.S. The Germans had planned out when they built those where to put the explosive charges so that they could knock the overpasses down onto the freeway, if you will, and that made it a little difficult. Had to use explosives and so forth to get the steel I-beams cleared out. And so that was one of our first assignments. And then mainly a lot of keeping the roads open. So that was kind of what I did.

They had a point system to get on a boat back to the States. And so I didn't have too many points, so you got shuffled around into odd units and so forth.

And you said you served for three years, is that right?

No. I went in '44. That's a little fuzzy right now. Those dates are probably wrong.

But towards the end of the war.

Yes. Yes. Well, I remember that we were down in Marseille, France. There was an engineering depot down there where all the bridging and so forth, equipment, and they were [00:10:00] getting ready to send it to the Pacific, but that wrapped up rather rapidly, and so, I got [back] finally on like Christmas Day of '45, we sailed from Marseille and we got into New York harbor about January the fifth or sixth of '46, I guess.

And I went back to the university, but I decided to switch to mechanical engineering. It didn't make too much difference because you were mainly taking the first two years of the

scientific courses and so forth, chemistry and physics and all like that. And it was while we were both students that I met my wife [Jean Crooks], and we were married shortly thereafter. And she graduated and got a job working as a teacher in a child care out in Richmond, California. You familiar with the Bay Area at all?

A little bit.

Well, Richmond is a city north of Berkeley on the shore of the San Francisco Bay, on the eastern shore. And they had a lot of Henry Kaiser shipyards up there, and they had a lot of public housing and so forth, and they had child care centers so the workers could bring their children there night or day and leave them off, and they had a system of taking care of them. And then when they were old enough to go to school, they could go to school in the daytime and come there to be watched over. That's what she did. I went to school under the GI Bill.

So I graduated with a bachelor's in mechanical engineering, with a machine design option. And we started our family, and I have a son, Jim, and daughter, Kathryn. Jim worked at the test site in the operating engineers union as a [00:15:00] welder and so forth, and later he was in the heavy duty repair of the motor vehicles, and he was the foreman of that shop there in Mercury for a couple of years. It's kind of getting out of sync here, but anyhow.

Oh, no, that's interesting.

And our daughter Kathryn was born just a year after Jim was born. And she went on to university and so forth, and she's a medical doctor now. And she presently is a physician working for the Veterans Administration here in Las Vegas.

I'll jump back to what I did after I got out of school, my work history. The first job that I had was with a firm called Grove Regulator. They were located in Emeryville, another city almost surrounded by Oakland and Berkeley. And they had a factory that had been built by the

Navy. Grove somehow, I believe, was an officer in the Navy at one time, and he developed a special regulator for steam, and it was used extensively on the destroyers. So they built a factory and he had this factory. And after the war was over, why, and the building of the ships, they switched from concentrating on steam regulators to valves and so forth for the oil industry. Like they had valves that were used to control the flow and so forth. So I took the job for them and they told me how much I'd make and that's fine, but they neglected to say there had to be five Saturdays in a month to make that much.

So after six months, why, I was looking around for a job and I got a job with the East Bay Municipal Utility District. That supplies the water to the whole East Bay. It's the utility district and so it had like civil service and so forth. And after a couple years there, I was looking forward to my first raise and that's when, I forget the name of it but there was some kind of a system, **[00:20:00]** defense system, and it was cancelled, so that meant that there was a whole lot of surplus engineers, and once again I was looking for a job.

And this time, my father-in-law was a long time employee with Standard Oil of California, and he said, well, there's this outfit over in San Francisco and I understand they're hiring. Why don't you go over and talk to them? So I went over and talked to the people, and they had formed a corporation called California Research and Development [CR&D]. And they were to be kind of the construction management of a project that was associated with what is now called Lawrence Berkeley National Lab, which was run by the founder, E.O.L. [Ernest O.] Lawrence. And the idea behind this whole project was that they wanted to use neutrons to irradiate thorium and whatever to get more plutonium. And so they had proposed building a proton linear accelerator that would use protons to hit a beryllium target, and the protons would knock neutrons out of the beryllium and they'd use the beryllium to

irradiate the thorium to make fissile material. Now, I think that's right, but that was my understanding of it.

And so they needed a linear accelerator built at Weldon Springs, Missouri. They were going to build the facility back there because of the lots of coal-fired power plants back there. And this accelerator would be fifteen hundred feet long, fifty to sixty feet in diameter, and it would have drift tubes. So that was what they were going to build. And so they decided to build the first hundred feet of that to work out the problems and so forth before they started. And **[00:25:00]** the main problems would be at the front end where the drift tubes would be closer together, and because the particles would be going slower, but the electrical gradient would be more apt to spark down and short out where this narrower gap was.

So they were going to build the first hundred feet of this, and they selected the Livermore site to build this. And Livermore Naval Air Station was a mile square with a center section that was, say, half a mile by half a mile, was completely paved so that you could land in any direction, no matter which way the wind was blowing. You just had to have a chalk line or a mark.

So that's where they started that, and CR&D, now, would be working with the Berkeley Radiation Lab under Lawrence, E.O.L., Ernest Orlando Lawrence. And so a group of us from CR&D were moved into the bevatron building there in Berkeley to help support the design work and so forth of this hundred-foot-long accelerator. And then after a year or so, we moved out to Livermore, and they were building this building that would house the accelerator, and got involved in that.

And after working out at Livermore for a couple of years, they decided that they didn't need to have this. The whole project was cancelled. [They decided] that reactors were taking

over and going to be able to provide all of the fissile material that would be needed. So CR&D let go all of their engineers. They just shut the whole—but meanwhile, at the Livermore site, the Berkeley lab had expanded out there and the laboratory had opened up, so I went over and got a job with them, and that's how I started with the Lawrence—it wasn't called that then, but the Berkeley Rad Lab at Livermore.

About what year was that, do you remember?

Well, I went to work for them— [sound of papers rustling]. That I should be able to find.

[00:30:00]

Was it the early fifties, or was it still the forties, then?

No, this was '53. September the sixteenth, as I recall. Yes, 1953 was when I started there. See, I went back to the university after the war. I started there in January of '46 and I finished up in August of '48.

So when you worked at the Rad Lab, who were you actually working for? Was it the government or the university or the laboratory itself?

Well, when I first went to the Berkeley lab, I was a California Research and Development employee, and we were in support of this thing that was going to be at Weldon Springs, and they were working on the injector. And I happened to be the engineer that was supporting the rad lab physicists and so forth, and so I would design what they would want, and they would take care of getting it built. And then when we went out to Livermore, why, then we got involved in projects that were more going to be—like they had this vacuum vessel a hundred feet long, I guess, and maybe it was sixty feet in diameter. It had thirty-two-inch diffusion pumps. That was the throat of the diffusion—you know what a diffusion pump [is]?

No, I'm not familiar.

Well, you want a vacuum. You want to get all the air out so the protons don't have to run into air molecules, and also if you get the air out so there's no humidity, then you can have greater electrical gradient. Somehow you have a loop. There's a vacuum tube back here that's oscillating and it's putting out voltage and it comes down a coaxial rather than a cable. It's two pipes, inner pipe six inch in diameter, outer pipe ten or twelve inches, and has a coaxial power feed, and it went down and it had a loop on the end, and that created this field that was running back and [00:35:00] forth in this—there's a large vacuum container, and then in the early models there was a framework, another of—on an aluminum frame, copper sheet, water cooling pipes on the back of the pipe, copper sheet, because all this current would heat up the—and so, you know, putting water in a vacuum vessel before it can spring a leak. So we ran into structural problems where it was a cylinder, and then you had this liner inside it, and drift tubes hang down, and then there's a tube, and you inject the protons out of the injector in, and that pulse has to get there just as the gradient comes out of the one drift tube and gets accelerated into the other one, and it goes on, keeps on going down the pipe. Well, that was what we were trying to do, and so there were lots of engineering problems and so forth.

But I was, for the first like three years that you might say, I was two years anyhow an employee of CR&D, and then I went to be a laboratory employee. And like I say, I started on September 16 in '53 and I retired in, I forget when. Thirty years later or more.

So after I went to work for the university, or radiation laboratory, the first couple years were taken up with this accelerator project. And then they decided that the government wasn't going to build that because they'd found other ways to accomplish getting the material they needed. And so I joined the mechanical engineering group of what's now the Livermore laboratory. And I got involved with other activities that were going on regarding the test

program. And after coming down to the test site for five or six years, to come down and do experiments or participate in the tests out at the test site, why, the laboratory had a fairly large contingency at the test site. One time they had 300 employees, and that was in the days when they were working on the Rover project. You ever hear of the Rover?

[00:40:00] *I did. That was propulsion, right?*

Yes. Yes, well, I never was involved in that. In fact, that had folded. But they had a position that was called the resident manager that was the head guy for the Livermore lab down here. And after a few years, they decided to ask me to take over. And so I came down and followed the existing resident manager for a year, or six months, as his deputy, and then I became resident manager. And we had about 150 employees here, working in Nevada and Nevada residents and so forth.

OK. And what were your responsibilities as the resident manager? What were you in charge of and what did you do?

Well, you had to support the programs, and they expected you to look over what's going on and if you see something wrong, even if the people in Livermore are doing it, why, you have to take care of that. Most of the time things went smoothly, but occasionally you had to kind of whistle-blow. But that didn't happen much.

So it was more of an administrative, supervising everything that was going on?

Yes. Yes. We had a health and safety group and, you know, we had to be sure that we were happy with what REECo [Reynolds Electrical and Engineering Company] was doing in the way of personnel protection and so forth, and if we didn't like it, why, we could bitch about it and try and get it changed and so forth. See, the laboratory at that time had a reactor out there, and it was called Super Kukla. Because of critical mass, then it would give off neutrons and they did

experiments and so forth with things. That was out in what is called Area 410. You ever hear of that?

Yes.

Originally that was just for the Livermore lab and then, I guess, as things developed later on, I think that LASL [Los Alamos Scientific (now National) Laboratory] now has some buildings out there.

[00:45:00] *What were some of the most frequent problems that would come up? I imagine there's a lot to deal with, with all of the different laboratory people and all of the test site people and the REECO people. What kinds of things were the biggest problems?*

I don't think that between the working things you—over the years, understanding developed, you know, even the union people had their prerogatives in what they wanted to do and had to do, but it never really boiled up, that I'm aware of, into like, we're going to walk off, or whatever. I can remember, you know, one night we were trying to button up a tunnel, and I was exhausted from throwing sandbags—and that wasn't when I was a resident manager but when I was involved in the group that put the device in the room and had to watch out for it and so forth. It became clear that in order to get the shot off, why, whoever was there had to pitch in and get it done, and we did.

I imagine there's a lot of pressure to get it done, so everybody just worked as hard as they needed to. Lots of long days, long hours?

Yes.

Now, as the resident manager, did you live on the test site, or did you live in Las Vegas and commute?

I lived in Las Vegas and commuted. But, you know, I didn't spend many nights at the test site when I lived in town. I mean when I was traveling, coming down from Livermore, why, I never went into town. They had an airplane that flew from Livermore to [Camp] Desert Rock, and so I would rarely go into town. I would only go into town if I had to go to a meeting down at the NVOO [Nevada Operations] office over there. Was this the kind of information you're looking for?

Oh, this is great, just getting all of your experiences. It's just interesting to see what a typical day at work was like at the test site, because a lot of that never gets recorded, so it's really interesting to hear.

[00:50:00] Well, it always seemed like there would be something that would come up.

Now, how were you involved in the tests? What would go into a test, from your standpoint? What were your responsibilities and what all had to happen in order for a test to go right?

Well, throughout my career, that varied greatly. I started out with getting involved in the testing as the engineer that was designing the nuclear warhead or weapon, whatever you want to call it. It had to be built and fabricated, put together. Now, that's what we called a device engineer. And it was a mechanical engineer, as a rule, you know, that designed it, had to get it built, get a lot of exotic materials. A lot of it was built at Y-12 at Oak Ridge. See, they were involved in the production and fabrication of parts for the stockpile, and so they had the capability of producing what we needed. We could do it at Livermore, but these guys were the ones that were going to be doing it, and so we relied on them to fabricate the parts, and then we'd take them and put them together and so forth. Like, for instance, I was out in the Pacific and they decided they had to have a design change in some of the parts that were inside the thing. And so we had trailers out there with lathes and so forth, and so we went over and we figured out, and this was a part that

needed machining and so forth, so we machined it out there. Then we took the part in, tore the thing down, and put it in, way in near the center of the thing. And kind of got some people upset that this is a material that is accountable and so forth, but it's also pyroforic, and so we just took it over and threw it in the ocean and got rid of it because we never would use the material and they had plenty of it. So they got a little flak over that.

[00:55:00] *From who? From the government, or who was complaining about that?*

Well, the accountability guy. You know, I just said, why don't we just say it was destroyed and I'll sign it "destroyed." You saw it. It had been reduced to powder and so, you know....

How many tests did you work on when you were at the test site? How many tests were you involved with?

Well, I couldn't tell you.

A lot?

Well, we had a case where—this was when I was a device engineer. I was working at Livermore, designing things, taking them to the field. OK, we had five-hundred-foot-tall towers. You have seen pictures of those. OK, we have dry runs, OK, where we run through like a countdown and everything. And we were going to see that the firing system was going to work right, everything was going to do this, that, or the other. Well, on a shot day, they'd take the elevator hoist away and save it, use it for another one. OK, well, they had a dry run, and seeing they weren't going to take the elevator away and bring it back, they didn't disconnect the power to the elevator so it would be taken away, or they didn't change—well anyway, on the dry run, there was still power and something was left plugged in, and so that caused it to be activated when it wouldn't have been because there would be no power to where it was plugged in. Well, that screwed up the device because it transferred part of the material in and that caused it to oxidize, if you will, the

material. And so we had to take the whole thing apart, and people had to climb up, all the way up, because the elevator was gone and wiring was fugged up and everything. So, you know, **[01:00:00]** that is the kind of problems that you'd get into. People had to go up and take care of a portion of it. A gas fill of the pit. You got a chemical reaction, hydride, and that ruined the pit. But, you know, it's just that a dry run wasn't a dry run, and so sometimes you'd get into discussions like that.

Now, when the tests were conducted, did you get to watch the tests?

Well, like if you're the device systems engineer or the device engineer. The device systems engineer, he's in the control room, right there, watching this. As the EGG [Edgerton, Germeshausen, and Grier] guys go through their countdown, why, you're watching to be sure that this light comes on or whatever at the right time and so forth. You know, everybody has their own little thing that they're wanting to be sure doesn't screw up.

Did you ever work for atmospheric tests, or were they all underground by the time you got there?

Well, the early tests that were up on the towers here at Nevada were atmospheric tests. And the ones that were suspended from balloons. Did you ever hear about those?

Yes.

All the ones in the Pacific were atmospheric tests, when you're testing at Bikini and Enewetak and so forth. The tests were done on barges, and the barge was as big as this room. And you could have your device and then you have your cables come and hook them up and so forth. In the towers, the cab at the top would be about as square as the width is here, about 25 feet by 25 feet by 15 feet tall, and everything had to be within there. And they were doing things to see when the shock wave and how things are performing within the device. They have windows in the case, like, so that you can see how the radiation comes down through the device, and they

want to look at that. You know in Area 2 where the shots were, those towers? They were looking [01:05:00] at the stuff from back by the CP [control point], and so you have to have all these pipes come out and be lined up and all like that. There was also a bunker up by what—I forget what you call it, but the road that runs down the side of the valley. What do they call it? Red Road?

We could look that up. I can't remember either.

Yeah. Well, anyhow, on the west side there's a bunker up there and they're looking at other things closer in.

So you worked on the Pacific tests also, right?

Yes. The main effort there was in Honolulu, Barber's Point, and we'd have to assemble the thing out at Barber's Point. I forget what they called that airport that the B-52s took off from. But we'd have to assemble the device and so forth. That was easier because there wasn't diagnostics. They just looked at the outside of the bomb casing or whatever, and so less complications on that. And you had to work on getting that done. But it was very straightforward. They always wanted a lab guy with a fire crew. And here you are [drawing a diagram]. This is the runway, and if the fire chief is here, he wants you right next to him, and here comes this [B-] 52 by. That's really, really a sensation, to see that thing coming, and it's coming and it's coming. You just hope it stays over there.

OK. Well, this disc is about to run out, so maybe we'll take a break and put in a new disc.

OK.

[01:08:54] End Track 2, Disc 1.

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

OK. Well, one thing that I just wanted to ask you from before, when you were doing these tests and watching, especially the atmospheric shots, I'm just wondering what your reactions were as far as what it's like to see one of these tests? Because I imagine that's a pretty spectacular sight.

Yes, well, you have time enough to decide that you've cooked this side long enough and let's turn around. That's one thing I recall. You know, it might be fifty miles away. Some of those out in the Pacific, it was really pretty warm.

The JVE [Joint Verification Experiment, Kearsage] activities were real interesting to be involved in.

I'll bet. And how were you involved with the JVE? The Joint Verification Experiment, is that right?

Yeah, well, I was down here as a scientific advisor, if you will, and I was working for Jim (James) Magruder. I mean, a lawyer is scientific advisor to the manager of NVOO. That's what they call you. It was an interesting two years. And I worked a lot with Jim Magruder, who was the assistant manager for operations, I guess. He was running the test program. And we were involved in getting all of the stuff over there [to the Soviet Union]. And there was core barrels used in the post-shot drilling, you know? Are you aware of what post-shot drilling is?

Yes.

And how they go back down to get the sample and so forth. They had core barrels but they were, I forget, thirty or sixty feet long, and they needed to get some of them over there. And we were going through hoops. I mean it was going to cost us two or three—I can't even think of it. A C-124, I guess, or bigger airplanes, you know. Because that's what it would've taken in order to get those long barrels. Well, they got threads on either end, so I said to them, go cut them in thirds. And then we shipped them over on commercial air. So that was a contribution. But lots of

interesting problems. You heard that I had decided that I wasn't going over there because [00:05:00] my health was starting to go down about then, and I'd heard one guy's tale about how he got sick and so forth on the trip and couldn't get into a decent hospital. So I wasn't going to go over.

Yes, that's a long trip.

Yes, well, it's a long trip, and after you got there, why, I think there was several things that would make it longer.

Right. Exactly. Were you involved at all when the Soviet scientists came here to the Nevada Test Site? Did you work with them at all?

I didn't interact directly because we were just kind of sitting back, watching what was going on, and those people that were in the program were the ones that had to be interacting with them, and so I didn't have much direct interaction with them. More, you know, should we let them do this, and what should we try and get them to do? Or whatever, you know, that kind of stuff.

I'll bet there were a lot of security issues in trying to deal with that.

Yes.

Now, that's another thing that I'm interested in, is obviously the work that you're doing is very sensitive and related to national security, and I was wondering what kind of clearances you needed, both when you worked at the rad lab and when you came to Livermore and the test site, and if you could talk a little bit about some of the rules that were in place for security.

Well, everything, you know, about the design and so forth of a nuclear weapon is secret. Some of it is RD [Restricted Data], other it's just secret. You just have to be careful and make sure you don't discuss what is classified and so forth. Of course, a lot of it when you're dealing with like

the Russians, it's just common sense. A lot of it is. But when you get in the intelligence part of it, why, then it goes up.

Now, was that ever a problem with your family? I mean you spent all this time at work and then you'd come home and there are so many things that you're not allowed to talk about. Was that difficult, or was that just part of the job?

I think you just develop, you know, just—she [wife, Jean Crooks] doesn't ask and you don't. We never— **[00:10:00]** she never—there are certain things that, you know, like the accident. The bolts pulled out. Down it went. Did you ever—?

Was that Baneberry, or a different test?

Well, I can't even remember the name. [Peninsula, 10/23/1975]. There's very few cases where the thread diameter and the pitch of the thread will let you put a small bolt in a hole and it'll hold for a while, and then it strips the threads, and the whole goddamn thing fell. And one of the employees was in the cableway and he got knocked down and crippled, essentially, for life. It's just plain, dumb good luck that somebody wasn't killed. No, I just never talked much about it. Never had any conflict with my wife over it.

Now, we were talking a little bit before about what you had to do to get the Q-clearance. Could you talk a little bit about that? I mean what did you have to do to get the clearance in the first place, when you first started working there?

Just fill out the paperwork. And to not have done the stuff that you shouldn't have done before. And so they did an investigation, a background investigation, into everything you had done before?

Yes. Yes. I guess the closest thing I came to ever having a police record was I had a home up in Berkeley, in the hills above Berkeley, and the lot went down like that [demonstrating], about like

that. And I was clearing some of the small eucalyptus trees, that big around [demonstrating size] that would grow up in two years, *shooo!* And I was moving things, the brush and so forth, around. And some guy that had a lot down below me thought that I was dumping stuff on his property or so forth. So he didn't come and say anything to me, but he had gone to the cops. And so somebody came up and they wanted to know and I showed them. Well, nothing happened. And then finally the guy did come around and he said, Oh, jeez.

But that's the sort of thing they looked at, right? Criminal records and that sort of thing?

Yeah, well, and I guess if you were, you know, somebody that drinks a lot and runs off at the [00:15:00] mouth, why, there's a chance of—but you know, I never had any problems, and that keeps going up and up the further you get into the intelligence part of it, why, then the more they look.

Now, how did you get involved with the intelligence aspect of the DOE [Department of Energy]?

Well, the Livermore lab has a group that is involved in that, and so I did some work in that and went back to Washington [D.C.] and did work for them right there in DOE headquarters in—I can't even think of the name of the building now. Forrestal Building. Is that right?

I think it sounds right. And that was in '83, you said, that you started working in Washington?

Yes, I guess, something like that. Well, that was at Livermore. I was in Washington in November of '81 until September of '83, working for the Division of Intelligence.

And so what did you do? What was your job title there, do you remember?

Well, we didn't have a job title. In fact, you can't supervise, you can't do this, you can't do that. Don't direct the government employee. But if you just use common sense, why, you can do your job, or what they want you to do and you can do it. But you don't say, hey, Jack, go do this. You talk to his boss. And you can't represent yourself as a government employee. You're a lower

class citizen that's *working* for the contractor. Everybody is a *contractor*. Even the University of California Livermore lab is a contractor back there, as far as they're concerned.

And the Division of Intelligence, what kinds of things were they interested in, or what were they responsible for? Were they investigating things within the lab, or were they looking at more outside threats from outside the labs?

[00:20:00] Well, it's just assuring that the people that are assessing what our potential foes are doing and that they are coming up with reasonable explanations and so forth. So that's using the various resources of the intelligence to try and figure out what your potential enemy, when they do a nuclear test, what do you know about it? And so forth. A lot of it was, for years, based on whether they were violating the treaty or we. A hundred and fifty KT [kiloton] was that.

[Threshold Test Ban Treaty, 1974] And so as it just turns out that the test site is a region that seems to transmit the seismic signals better, so the Soviets were always saying we were breaking the treaty, but that's where the JVE, I think, got people together and they started to understand. When I was here as the scientific advisor and so forth, we were developing seismic stations that could be placed wherever we wanted, wherever we could get them placed, trying to understand about the Soviet testing. And they said we were always violating the treaty. Then, I think, after they did those two experiments, why, then—personally, I never saw any of the data or anything, but I think it just proved out that one site was coupled better than the other. I don't know whether that—that's my understanding of it.

So did you work with the other intelligence agencies that were keeping an eye on the Russians?

Did you cooperate with them, or did you have your own analysts working on that?

Oh, read this. You can go look at what they have and make copies and so forth. The difference between a hole on the ground, like in two, three, or all of the vertical holes, and what goes on in a tunnel are quite different. Other people do things in different ways, too.

Well, going back to talking about the Russians and sort of the Cold War atmosphere that all of this took place in, I was wondering, how did that play out in the test site? I mean were you aware of—I guess what I'm trying to say is, did you have a Cold War mentality? Did you see yourself within the sort of context of, you know, facing off against the Russians and having to keep up with the arms race?

[00:25:00] Well, no, I—

I've heard a lot of people say that they were so intensely involved in what they were doing that they didn't really think of the Cold War. They just thought about their immediate job. But other people are saying that they were aware of the Cold War and that that was one of their big motivations to do this work. I'm just curious if you had any thoughts about that.

Well, I think that you have a job to do and you try and do it the best you can.

Another thing that you mentioned earlier was that your son worked at the test site. You said he was an engineer and—

No.

He was a welder, right?

Yeah.

I was just curious about how that turned out, how he got to work at the test site, and some of his experiences.

Well, he was working out there and, like I said, he was a foreman of the heavy duty facility. And, well, I just don't want to—he didn't leave there in the best of terms, I guess, but they were reducing all around and so—

About when did he start working there, do you remember?

When did he start working there? No, I don't remember. James Crooks. He's just turned fifty, I think.

Did he work at the test site for a long time, or was it a short—?

Ten years, I think it was, at least.

And did he work for REECo or—?

REECo.

Oh, OK. Now, one thing I've noticed in a lot of the people that I've talked to who worked at the test site is that there's still a strong bond between people even now. And I know that you and lot of the old AEC [Atomic Energy Commission] and some of the DOE, the retirees, we met at the luncheon, and these people, you worked together and now have retired but still keep in touch and meet on a regular basis. And I was just wondering what it was that made that experience stand out, that these people who worked together, you know, twenty years ago, thirty years ago, would still keep in touch and still stay connected?

Well, I can't say that—well, you know, there's a guy that worked for me, Gene Freeman, and he now lives in Texas somewhere, and he's into the e-mail stuff, and my wife is. We got a

[00:30:00] new computer and when we got the new computer I can't even make the damn arrow go around the right way, you know. But, you know, I guess that one thing that I think might have influenced it is when you're working, you make trips and you go to places, and so you have more of your social life when you're working. You socialize after work. And I think working at the

test site, with the long hours and so forth, it tends to get that started. Like [Fred] Huckabee He calls me once a month to remind me. He's the guy that calls me. Before it was one of the gals that used to work for LASL out at the CP, and she died just a couple years ago. Jeanie [Sowder] was her name. But I think that might have something to do with it. And also you have lots of time when you're waiting for things to happen at the test site when you can have conversations. *Right. I imagine it's such a small community of people who are working either at the labs or at the test site, so you're always running into the same people.*

Yeah.

That's interesting. Do you ever miss the work? Do you ever miss working at the test site or working at the lab?

Well, yeah, I guess I miss working, but then again, I'm eighty years old. We both are. And I spend a lot of time in doctors' offices.

Do you still keep up with things going on at the test site?

No. You know, once you're out of it, why—I don't know what their problems are now.

I imagine a lot has changed since, you know, even five or ten years ago.

Yeah.

Have you been back there at all since you left the test site?

To the test site? Well, you see, I left in, what did I say it was? Seventy-nine. Well, then I spent about ten years in Livermore, going to Washington for a couple years and doing this and doing that, and then coming down here for a couple years before I retired. Got myself a job down here.

[00:35:00] Took two years to Washington in intelligence work. And then coming down here to be a scientific advisor to the manager, which I guess that's a nice way of getting somebody down here. It trades off between Los Alamos and Livermore. And I don't even know who it is now.

When you were the scientific advisor, what kinds of things were you involved with?

Well, all the work I did in association with the JVE was when I was in that role, and that's when I was working in a group that works for the assistant manager for operations. That was Jim Magruder when I was doing the job. And Sean Stanke [sp] and there was about four of us, and we tried to coordinate things, and coming up with cutting the core barrels was one of the things.

And that was for Department of Energy, am I right?

Yes. Well, yes, what do you mean by that? It's the Department of Energy, Nevada Operations Office [DOE/NV]. That's who I was—we were—part of the time, I was just like one of the group, following the day-to-day operations. The other part of the time, I headed up a couple studies on the operations, trying to see if we were doing the proper thing about treatment of the radiation that escapes off the test site, whether we were following too strict or not strict enough. So we wrote up a bunch of recommendations and then the manager wrote back and told me why he couldn't follow the recommendations.

And that was in the late eighties, '87 to '89, I think you said?

No.

[00:40:00] *We could find it later. It's OK.*

I was scientific advisor to the manager of NVOO from 12/85 to August 19, '87. So all of this stops in '87. I was working down here, and I went up there and checked out of Livermore in two days, and that's when it stopped. The closest I've been to it again is working when they had the museum, if you will, was out on Losee Road. We used to go down to that little room. I had never been in this present museum [Atomic Testing Museum]. I decided that I wasn't going to drive halfway across town. Layton O'Neill and his wife and a lot of them do. You even see Phil Allen. He said he did an oral history and so on out there. He was head of the weather bureau.

Oh, OK. Interesting. OK, well, I guess that's about all I have. It's interesting to me how you've had so many different experiences within the testing and weapons program, from working at the lab to working at the test site and to working in Washington, and then going back to the lab and back to the test site, and I was wondering if you had anything to add or any memories that you wanted to talk about.

Oh, well, I have that one memory that I can recall, when that thing fell in the hole.

The accident?

Yeah.

Do you remember about what year that was?

No. Let's see. I can't even think of the name of the event [Peninsula, 1975]. But Sid Hamilton would know, to the minute, I bet.

Yes, we can look that up. That must've been a tough experience to go through. I mean were there a lot of things that went wrong and accidents at the test site, or is that more the exception rather than the rule?

Well, I think that's the exception, not the rule.

I mean obviously it's dangerous work, mining and working with towers and weapons and that sort of thing.

Yes, well, you know, we'd been doing things for years and years, then to find out when you go through it, looking at the detail, that only one place, I guess, it said that the pitch of the threads **[00:45:00]** and the diameters, that you can put the wrong size bolt in a hole.

And that's what happened then, right?

Yeah, you know, and that's kind of like the case where the bolts like that, critical bolts in the load pad, were supposed to be certified and locked up and put over. Well, you know, I was in a

car driving, and I think *I* initiated having every corporation that had any employees around there, going around and making a head count to be sure that there wasn't somebody got sucked in that thing. Could've happened, you know. All those cables going *tshoow!* Well, let's call it quits.

OK. Well thank you for your time.

[00:46:47] End Track 2, Disc 2.

[End of interview]