

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

Interview with
Vernon Jones

October 4, 2005
Las Vegas, Nevada

Interview Conducted By
Mary Palevsky

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

Mary Palevsky: *So Mr. Jones, I want to thank you for speaking with me today, and if you could start out by giving me your full name, place of birth, date of birth, and a little bit of family background and how you ended up working at the [Nevada] test site in the fifties.*

Vernon Jones: My name is Vernon H. Jones. At the present I'm turning seventy-five. I was born in Toledo, Ohio in 1930; November 4, 1930. My dad was a sign painter at that time, and of course going back that far, you're probably not interested. I went to high school, at Glen Burney, Maryland. From there I went into the [U.S.] Air Force. I spent four years in the Air Force, stationed at Kirtland Air Force Base [New Mexico] in the final years. The way I came about getting the job with EG&G [Edgerton, Germeshausen, and Grier] that I have, is that a recruiter came to the base there looking for employees, people to hire. He was a person from EG&G, and a number of the people there, well, they accepted the job with EG&G. I got in on that [at a later date as I missed making contact with him], so I wound up going from the service to work at EG&G.

I'm going to stop you for a second, just because I'm curious about when you went in the Air Force; you would be pretty young to be there during World War II. What was the story there?

Well, the draft was getting real close onto me and the guys in about the nineteen/twenty-year range, their name was getting ready to come up real quick, so rather than get drafted and get stuck in something I didn't like, I joined the Air Force.

And what year was that?

Nineteen-fifty I joined. December of 1950. I wound up stationed at Kirtland Air Force Base. I recall then that Kirtland at that time was sending aircraft out to the islands for the air drops that they had out there.

Well anyway, so I put my time in there. Toward the end of the enlistment, a person from EG&G was there at the base looking for people to hire to work at the test site. Well, I missed making contact with him but wound up with EG&G anyway.

Now what was the particular skill that you think that you had that made you someone EG&G wanted to recruit?

I worked in Electronics Division, radar maintenance, ground crew, and apparently EG&G was after people that worked in instrumentation categories, so they were there to see what they could get. I take it probably they knew there was going to be a whole crowd that was going to get out [in December 1954 and January 1955] about the end of our four-year term because we overloaded the system, as so many of us had enlisted four years earlier. So there was a lot of people getting out, and I think there was about eight or ten of the guys there at the base, then, that wound up going to EG&G.

Now were you single at the time?

Yes, I was single at the time.

So they recruited you for this job at EG&G, and what happened next?

Well I missed being recruited at that time; I took them up on it later. Actually, I lived in Baltimore at the time, as I went back home after I got out because I had applied but hadn't heard from them yet that I had the job. I went home and I actually wound up being eligible to get a job at a GE [General Electric] plant there, I told the guy, I says, I'm waiting to get the job at EG&G out in Las Vegas and they haven't answered me yet and as soon as I get an answer on that, I'd probably be quitting. So he says, well, send them a

telegram. They'll answer that before anything else. So I sent EG&G a telegram that I had applied for a job there and I want to know if I got the one with you people or not. And they says, Come on out. You got it. So I called the GE place and told them, I says, Hey, I got the job out there, and they said OK. So I came straight out to 1622 South A Street and was interviewed by Herb [Herbert] Grier and John Ennis and several others. I had the job confirmed right then and there.

So that was here?

Nineteen fifty-five, yes [in January].

So it was nineteen fifty-five and you came to Las Vegas and Herb Grier and—
John Ennis interviewed me. I can recall those two interviewing me.

The first thing I did was help them modify some of the instrumentation chasses for the diagnostic people. That went on for maybe a month. At that time they were also putting together new photo station trailers, mobile units. There were six of them and I got in on putting those things together. That was the beginning of where I started out in EG&G, basically, in field photo.

[00:05:00] *So when they are interviewing you and when you're being recruited, at what point do you understand that it's for nuclear weapons testing? How does that work?*

I don't remember.

But you knew from World War II about the atomic bombs and all this?

Some. Not much. To me it was a job and it paid better than anything else I could get back East.

Well, I just took it. So I wound up doing what I did there and I've enjoyed it ever since.

Now were you stationed for your job at the test site or here in town?

Well, I lived here in town. There's a number of us had a motel room and we were living together.

So you didn't live out at Mercury at that point?

No. When the project up there moved us out there, we kept our motel room in town and we were commuting every day to start with. But we did have a room out in Mercury at the same time, too, so during the work week we would stay at Mercury and then on the weekends we would come back to Vegas.

So when you're first going out to the test site, what are the kinds of things that you're doing out there?

Well, [I] started out in field photo, finished putting the stations together. Then of course when the shots started to come along we had the vehicles moved out to their location onsite and started getting the cameras all set up and aimed and whatever it took to get the station ready for the shot. *Now did you have particular photographic ability or was it mostly your engineering ability that they—?*

It was the engineering side. I didn't know much about photography but that was only part of it. You had to put the station together and make it work, and I had no problem whatsoever since I had an electrical electronic background in the first place. It turned out that I didn't know it at the time, but I had more electrical knowledge than everybody else in field photo put together out there. So I didn't have any problem. I was the only one that was capable of repairing anything if it didn't work. If something in the station didn't work, I could generally say, *There's the problem right there, and fix it.* I know some of the guys out there could spend half a day looking and they'd still never find the problem. A lot of camera film was lost because of some of the people did not know what they were doing. And it turned out, it was in, let's see, 1957, the other individual and I, the set of stations that we worked—see they had two sets of stations, you'd alternate on the shots because there wasn't always sufficient time between shots to get set up for the next one, so there were two sets. Anyway, so Clint Webb was the other person I was

working with that year. It turned out that particular year every single camera that we loaded with film, we got pictures. Every camera worked perfect all through that entire operation that year.

We never lost a camera. That was in 1957.

What operation was that?

Let's see, what was it? [Operation] Teapot? No, let's see, that was probably [Operation] Plumbbob. Yes, I think '57 was Plumbbob. Yes, [Operation] Redwing was out in the islands, so that would've been Plumbbob.

Correct.

So we were real happy with that. And Clint, he was real good in the camera end of it because he was a photo bug. Well, actually the way the thing went, we were just people setting the stations up. We didn't have to determine what camera lens or anything; that was already determined by Engineering. We were just out in the field setting cameras up and making sure they ran.

Now the cameras are basically for the diagnostics at this point in time, is that correct?

Yes, it's a physical record of how the detonation took place; the cloud and which way the cloud went. Some of the cameras were real high-speed, two-to-three-thousand-frame-a-second jobs, and you could actually see how the fireball grew. Fireballs, the way I understand it, do not all grow symmetrical. They're uneven, so cameras would indicate that.

Now what was the first test that you saw and what were the circumstances of that?

I couldn't tell you a name on it. I have no memory. That's too far back.

Well then, let me put it in another way. What were your impressions when you first saw—what do you remember being impressed by when you saw these tests?

[00:10:00] Well, the first one that I saw go, I believe, was up in Area 7. I was up at Station 372, which was a permanent photo station located behind the CP [control point] up on top of a hill.

And I can remember as the countdown came down on that, I was standing there just trembling all over, I was so scared. Or not necessarily scared, but I didn't know what to expect. All I knew is it's going to be something huge out there and I was just trembling. It went and, well, I survived that, and so after that it wasn't quite as traumatic as seeing that first one go.

What did it look like?

Well, I'm not sure if we had goggles on at that time or not. We probably did. Just an extreme bright light comes on, which is what you don't want to look at with the bare eye; you want to have special glasses on or you turn your back. You could feel the heat; even though we were probably seven, eight, nine, ten miles away, I forget the figure, from it, you could still feel the heat all over you from it. And from what I can remember, it was just before sunup they would shoot, because the photography was always pretty much the best at that time and the weather was generally the best they could get in that time frame. So I remember that you could feel the heat all over you and from what you could see out of the sides of your vision, that there were no shadows that light was so intense; there was no shadows from the sagebrush the backscatter from it is so great. So I liked that. That was interesting.

Now that's another question that sometimes lay people who don't work in the field wonder. I certainly wonder. When you're seeing an explosion like that and you're involved in the work of it, do you ever make a connection with the actual destruction that it would cause in warfare or in real life, or are you more focused on the event in the moment?

Yes, the event at the moment. You know you're there to do a job and you hope everything works as planned; the success of it and watching it go and feeling that you're part of it.

So you're with EG&G. Do you have at this point—well, this is Los Alamos tests early on. Do you have any interaction with the labs or are you pretty much focused in your job, doing your job with EG&G?

Well, I never worried much about the lab part of it. Look, here's the job I got to do and I do it. Anything else, forget it. This is my job and that's what I'm going to concentrate on.

Right. So '55, your first test was probably, what were you saying, was it Teapot, you said? That's in February of '55.

Yes, that's when I went out to the site, so yes, it was Teapot. And if I can remember right, I believe it was in Area 7 or up in that general area.

Yeah, this first test on Teapot says it was Area 7.

OK, got that right.

And then there's [Area] 3 and 9 and there are several more at Area 7. So I interrupted you a little bit before you could continue. So you're out there setting up the instrumentation so that these photographs can—

Yes.

Now when a test was actually going to go, did you feel a change in the work rhythm? Did things get more intense? Were there ups and downs as far as the workload was concerned?

Well, yes, because I knew what I was doing. I didn't have any problem. Whatever was asked of me, I could do it, no problem. And actually, I don't like to say it, but I spent more time doing nothing than working because I was able to go out there and get our stations set up, no problem. I had the electrical down so fine, I knew more about how the stations operated electrical than all the rest of the guys put together. So I never had a problem. If something didn't work, I could go

right to it and find the spot—here it is, a wire is broken or a bad connection, etc. I never had a problem trouble-shooting.

That's so neat. So would people call you out, then, when they couldn't diagnose something?

Not very much because people got their pride and they don't want to admit that they don't know.

That part would get into it. I noticed that quite often. They wouldn't ask.

So somewhere along the line here, you meet your wife. Am I too early for this or—?

I knew her when I was stationed at Kirtland in Albuquerque; knew her for a [00:15:00] number of years there. After I got out of the service—I got out in December—we got married in July [1955].

So she came out here, then—

Yes she was in Albuquerque. We got married in Albuquerque and then we came out to Las Vegas and we were renting an apartment at that time.

Now did you drive out to the test site? Did you carpool?

Carpool, there was some of that done. Some of the time you would drive on your own. There were no buses at that time. If it required overtime and you had to work late, of course it's too late to drive in, so you'd stay the night. At that time the highway was known as the Widowmaker. You've heard that. The two-lane road followed the contour of the land. That's what made it so bad. And you always had the speed demons out there, there was no speed limit.

Now when I go visit the test site now, it's pretty deserted, but there must've been a lot of activity going on.

Oh, there was. I heard figures seven to nine thousand people or so were out there at times. Now this is my memory again I'm speaking of.

Sure. But it was a place where there was a lot of activity going on.

Oh, yes, a whole lot of activity.

And what was Mercury like then?

Well, the camp was probably not as big as it is now. I don't remember that much about it. All I know is the mess hall had the turnstile you dropped a silver dollar in, I remember that. Other than that I couldn't tell you much about it. There's a whole lot of blank spots in memory when it goes back that far.

Yes, that's completely understandable. So tell me a little bit more about the different tests that you saw and some of the things that happened on then.

Well, for the most part they were all very similar. We had our stations put in place and of course they were all surveyed in, which they had to do to get the valuable camera picture data that they needed. So every day, just about, we'd have a dry run, and we'd always be in the stations to watch the dry run to make sure all signals came in. Now at first, it would be just the signals coming in is all we'd watch to make sure all of them got there. Then later on we'd go through what they'd call the dry run deal where the cameras would all be loaded with film, just like a shot. Everything was set up just like the shot, and then they would go through the run and we'd recover the film and it would be taken in and they would process a piece of it to make sure that the camera was aimed properly and it was in focus.

And what about after a shot? Did you have to do anything then? Did you go in and recover the cameras?

No. After the shot, as soon as RADSAFE [Radiological Safety] would declare the area sufficiently safe, we would go in and recover the film only. That was always done as quickly as possible because radiation damages the film.

And did you have to wear special gear for that?

Yes, we always put on the overall coveralls and we wore the booties and they're all taped on. We wore respirators sometimes. It depended on how much radiation. Some shots were considered rather dirty and left a whole lot more radiation than others, so there was factors that determined how much we'd wear, I know we wore the respirators on some of them, and sometimes they would tell us go this way, it's too hot that way. So yes, we'd go in and we'd get the film and it was always like get in and get out as fast as you can. And of course when you'd get back, sometimes we would be radiated with material to the point we'd have to take a shower, and you took it over again if you didn't get enough of it off of you the first time. And they would decontaminate the vehicle. Some of the areas you'd have to go through would be quite warm yet. Of course, we always carried radiation monitoring gear with us. We carried most of the time that T1B instrument that you have here. That was our main deal to tell us immediately what radiation levels we were going in. And of course we had a film badge and [00:20:00] quite often a dosimeter that we would wear. So it was just all part of the game and everybody took it in stride. *Right. Now physically what happened with the film? Because I have no idea. The cameras are there. You remove the cameras. How does that work?*

Cameras, no. We would remove the film only from all of them. Some of them, you just take the film reel out of them and we had regular film-carrying cases that we would put the film in. Some of them had film magazines on top of them. Some of them were quite large. Like the Fastax camera had a thousand-foot roll of 35-millimeter film on top of it. The Fastax, the name of the camera, it was a real high-speed camera, and it would go through that whole thousand feet of film in one and a half seconds.

No way!

Oh, yes! You should hear that camera when it ran. It was like, stand back!

In what sense?

Noisy! The noise would scare you, hearing that thing wind up the way it did. That camera had a drive motor on the film feed and the take-up spool. That's how fast that turkey went. So there was probably an average, I don't know, six to eight cameras in each station. Some were small; some were there for just cloud cover, to see which way the cloud went after the shot. Of course they were real slow-speed cameras. And the others, we had the Mitchell that generally ran at a hundred frames per second. I don't know offhand what they were really after, but it was one of the cameras, and various other ones in there. We had some high-speed Eastman cameras, slow-speed Triads, and others, I don't recall their names.

You may have said, but how many stations, approximately, would there be looking at any particular shot?

Well, most of the time we had just three mobile stations [and the permanent Station 372] looking at the shot. Sometimes they would request another station in another area, so we'd set up a Brock house. It usually was about an eight-by-eight [foot] wooden building they'd put it in place, and quite often, then we'd have to put the stands in for the cameras. We'd use drill press stands with the tilt tables on them to set cameras on [along with all other necessary equipment]. So we'd put all that in the station and cut holes in the wall for the cameras to look through. It was not unusual to have a Brock house entered as another station. And of course Station 372, which is up behind the CP, ran on every shot. That was a manned station. And that's generally where we would go to watch the shot when it was taking place. It was up high on top of a hill, so we could easily see ground zero. Of course most of the spectators would stand down around the back door of the CP, looking out over the desert, watching the shot. But since we were part of that photo station up there, quite often that's where most of us would go to watch it.

Interesting. So you'd go in and recover all this material and you'd put it in this—

Well, every magazine or roll of film, we had something to carry it in. We would put it back in the same container to keep it clean. It had handles on it and all this, it would make it easier to handle, and we'd take it all back to the CP.

Now this is really a layperson's question. Are they worried as you bring it from the station to the CP about any of the radiation that's around? I mean are they lead-lined, or that would be very heavy, I presume.

[The only radiation we had to worry about was in the shot area itself.] I couldn't tell you how those lead cases were made. I don't think so offhand. But we'd just take them back to our home base there at the CP and turn them over to them.

Then they'd do what they did with them.

And let me tell you, now this may be classified, what I'm going to tell you. If it is, you can take it out, do whatever. That film was carried, at times, in the back of a personal vehicle to Las Vegas and turned in to the EG&G photo people there. I know, because I drove my car one day with all the shot film in it to town. Just like that. There would be no security involved. We'd just load it in the vehicle and take it to town. Most of the time, it would be an AEC [Atomic Energy Commission] vehicle, but sometimes a person's individual vehicle, if they were going to go home after the shot, weren't needed or whatever, that car took the film into town. I don't know if you want that on tape or not.

Well, I don't think it's a classified issue per se. We'll see. That's interesting, though, because it shows you that people are trying to get things done the most efficient way possible sometimes.

Yes, and to get the film into town as soon as possible, that was done. Like I say, I know for sure because I took it in one day.

And you take it over to the EG&G building or—?

At the time that I took it in, I believe it was the Charleston building by the railroad tracks where the film was taken.

[00:25:00] *Then we'd have to find out from someone who worked there where it went from there, I guess, or do you know?*

I have no clue. We put it there, and when I think about it now is we never got to see, at least I didn't, never got see any of the record that was on any of that film. We were never shown it. Now other people may have, but I was never shown any of it. And we used to ask questions about that, when can we see it? Never got an answer.

Well, I imagine that stuff was classified at that point, and I don't know. That's interesting. So you're seeing the shot, you're recording the shot, but you never get to see the film.

That's what it was amounting to. Now I got a feeling some of the guys, if they were in the right place and knew the right people, you probably saw some of it. But at least in the position that I was in and where I was, I never did.

Interesting. Well, that gives me a really nice, detailed overview of what that job involved. Were there any other details of it that you think would be interesting for people to know about that particular job?

Well, the other thing is, at that time the safe radiation working level was 15 mR [milliroentgen] with no protective clothing. You could go in and out and do your thing. But to go in on a recovery, you always dressed up with whatever they required for that shot. It depended on how much radiation the device scattered and where it went and the direction. Just about every time we'd shoot, we'd always shoot when the wind was blowing toward St. George [Utah]. That was the standard direction. If ever it was blowing toward Las Vegas, forget it. It was always going to

the east. So generally from ground zero the radiation pattern would always go toward St. George because that's the way the wind would be carrying it. And sometimes to recovery, the way the roads were and the location of the shot, you had to go through the area of where the radiation path was the heaviest. Other times, you could go around the other side and there'd be very little.

Am I telling you anything interesting?

Well, you sure are. It's really interesting and I don't have anyone that has worked in this position before, so it's really interesting.

Now you've been cleared, obviously. People often talk about what the situation was with the family and the wife. What was the sense, do you think, that your wife had of what you were doing?

I don't remember. I have no memory of how she looked at it.

But you obviously couldn't talk about work with her, I guess.

Well, pretty much no. It's just to me, the job I was doing, it was best not to say anything to anybody. So it turns out, a lot of the wives, they didn't know much of what was going on. It's just a standard thing you learn. Hey, this is security and keep your mouth shut. And what I was surprised about is I never had anyone approach me and ask me questions about the test site. And at times I was expecting that people would see you get off the bus or something in later years and want to know, hey, what are you guys doing out there? I was never approached once.

Do you have any idea of why that was?

No, I never could figure that out. The only thing that we could determine is the other side had so many people scattered all over Las Vegas at that time in every category that they already knew.

"The other side" meaning?

Well, other countries, Russia and other countries involved. We figured they probably pretty well knew what was going on anyway, so they didn't have to ask us.

Oh, that's interesting.

At least that was what I came up with and what a lot of the other guys figured out. Because you know, every shot was announced in one way or another for the people in town to know that it's going to go. And our radio communications, for the most part, there was no security on that radio. Of course the transmit signal and the receive signal were two different signals, so you had to have equipment to pick up what the transmitter sends out, and what the—what am I trying to say? It took two radios.

I understand.

You know what I'm trying to say—to get both sides of a conversation. People would say stuff on the net that at times you figured they shouldn't be saying that, but nobody ever seemed to complain. So the radios were not very secure, to my knowledge.

[00:30:00] *But you took the security issues real seriously, then.*

Yes. I didn't say anything that I felt that I shouldn't say on the radio. I just didn't say it. As far as I know, the phone lines may not have even been very secure. I don't know.

In those days I don't know. I don't know how that worked.

Because I heard people talking on the phone saying things that I really didn't think they ought to be saying it, but they were doing it all the time.

These are phones within the test site, though.

Yes, phones within the test site [and calling off-site].

So were you ever in the Pacific on testing?

Yes, I was out there.

Why don't you tell me a little bit about that?

Well, it was interesting. It was different. I don't have much memory on a whole lot of that.

Do you remember which tests, which series it was that you were out there on?

Well, I started out on the Bikini Atoll in '56, so I spent all my time there and I know a little bit about the stations I worked in, but that's about it. [I was there for one test only.]

Similar kind of work.

Very similar. [Though there were no mobile stations out there.] Just that we're out in the islands now and transportation was kind of slow at times. Let's see, we rode helicopters a lot of the times for getting around up there because the islands, the coral around them was such that you couldn't really get a boat in safely at any time of the day, so helicopters were used a lot.

So that was Redwing that you were there on?

That would be Redwing. Then in '58 I was on the Enewetak Atoll. In 1960 I was out there for the PMR [Pacific Missile Range] tests.

Let's start with Redwing. What can you tell me about Redwing? What was happening with those tests? It seems like it was a big series.

I really couldn't tell you much in detail. I can remember I was out there and we'd evacuate the island during detonation time and come back and basically that's about all I can recall [at this time].

Did you see those explosions?

[The first one only.] We were on board ship out there. We evacuated on the USS *Ainsworth* [USNS *Fred C. Ainsworth* (AP-181)] and I turned in a picture of that to Vanya [Scott, Atomic Testing Museum registrar], of the ship that we evacuated onto, and other than that I really don't remember that much. I know there was a 300-foot photo tower right beside where the T&F

[timing and firing] station was located. Other than that—Howe was the main island that I was on, manning a seventy-five-foot photo tower there. I got around to the other stations but I couldn't tell you much about them.

“T&F” station is timing and firing.

Timing and firing. It was right there on that one particular island. I don't remember the name of it, but this big photo tower was right there, 300-foot tower.

What was it like to be out in the Pacific? Was it interesting?

Yes, it was interesting. It was different. And you could expect it to rain every single day, and it generally always rained during movie time in the evening. That was a pretty given factor. It was going to rain.

Now the tests out there were bigger, a lot of them, than you were seeing, because you had megaton tests out there, too. Did you notice? Was that something that you could tell when you're watching the explosions from the Ainsworth? Did you notice the difference in scale?

Well, the only thing that I could really tell was the fireball was bigger, because we were twenty, twenty-five miles, whatever the ship sailed out to, that's where we'd be and watch it. But other than the size of it, to me it didn't mean a thing. We had a job to do, take the pictures, so that's what we did, or at least what I did anyway.

So you're there for Redwing, and then you said you were there for—

I can't remember off-hand.

You don't have to remember because we've got a book here.

Let's see, what was it? It was Teapot [NTS 1955], Redwing [1956], Plumbbob [NTS 1957], and then Hardtack [Hardtack I 1958].

Plumbbob, right, and then Hardtack. Right. So [Operation] Hardtack I is in the Pacific. And you were in Enewetak then.

I was stationed on Enewetak on that one, and most of the time I was stuck out on Mack Tower.

Why?

They just gave it to me, so I worked the Mack Tower out there on that operation. It was out in the middle of the lagoon, a seventy-five-foot photo tower.

And then you were in charge of that tower?

Well, yes, most of the time only two of us were out there, but there again I had all the electrical knowledge to run the tower. The other person, he helped me. I didn't say he didn't do anything, **[00:35:00]** but he helped. I'm not saying this to brag, but I had more knowledge to run that station than anyone that ever worked with me. But I'm not going to condemn the person for that. They were out there and they did whatever was necessary and they could do it, they were right there in the middle of it, too.

So at some point, I'm just trying to get an understanding of this, you're working on it, at some point it's getting close to the shot, and then you evacuate from there?

Right. [When I was there it was back to the main island only.]

And how long of a process is that to get you off the island out on the ship far enough away?

Well, the only time I ever got out on the ship was on the Bikini Atoll bit. No, in Enewetak, every time we had a shot there that I can recall, we just evacuated right back to Elmer; it was Elmer where our home base was. Everybody went back there, at least while I was there.

And how long were your stints in the Pacific?

Oh, you got me. I guess 25 to 30 weeks total [over four separate times], I would say, somewhere in that range.

So you must be going out there basically when it's getting close to the shot, you go out there to make sure everything's OK for the photography.

Yes. On the Bikini Atoll I know I got out there before the series started, was working helping set up the communications system [the control room and all photo stations] all over the islands. Now on Enewetak, I had to have gotten there before the series started because we were putting photo stations together. [I helped in putting the control room together first.]

Sure. But there's some people that we talked to that were there for months and months and months.

No, I wasn't one of them. [But those that got there real early, my memory has it, the early birds were there to get the communications systems set up all over the islands.]

You were a specialist that went in to—

Right. So all I had to mainly concern myself with was our photo equipment, my group. Now of course they had people that worked at detectors and other instrumentation, but I was strictly in the photo group only [once things got moving].

Right. Right. Now how would you get, actually, from Las Vegas out to the islands? What was the trip like?

Long, because it was propeller-driven aircraft at that time, so we flew to Hawaii first. I turned in some passenger lists on those flights that I was on to Vanya, so she's got that. And then of course it was still an aircraft flying all the way out to the islands. It was about an eight-to-ten-hour flight on that one. It was long.

And what kind of planes were they?

One, I think, was a Constellation. I think it's noted on the passenger lists that I got, what kind of plane they were. They were four-engine jobs. And from what I can remember, they all came in

on the island of Fred, the big airstrip they got on Fred. Then from there, we were flown over to Bikini on the smaller aircraft [in 1956].

Interesting. Well, it's just because air travel has changed so much in this fifty years.

Oh, yes.

A lot. So Hardtack I, and then were you back at the test site for [Operation] Hardtack II?

Yes, came back to the test site and picked up again and did some more testing. And then we shut down permanent. ["We" is the field photo group only.]

Right. Now talk to me about what you remember about that. Hardtack II was that last series and then atmospheric testing ended [This is an error. Actually this was not the end of atmospheric testing, but the last series before the testing moratorium 10/1958-09/1961]. Do you remember anything particular about that series because it was leading up to the moratorium, or was it just business as usual for you?

To me, I remember business as usual. We did our job.

Because some people have reported they felt rushed because I guess at the end the tests came pretty close together. Did you notice that?

[Speaking for the photo group only.] No, I didn't. Now that may be because I knew what I was doing, you know. I had no problems whatsoever, no matter what came along. I was the only guy that was repairing any of the equipment that we had if something went wrong. No I never felt rushed.

You just went out and did what you had to do.

I did what I had to do. A lot of stuff I did there, I worked by myself on a lot of the projects I went on, I was at Area 11 at [Operation] Project 56, I worked that pretty much all by myself.

Tell me about Project 56. What was that?

Now, if I got this right, that's the one, it took place on the east side of Yucca Lake. There was a series of four small tests. Are you familiar with it?

Not very much, and I was just noticing it here on the list. That's why I'm asking you about it. It's Area 11?

Yes, Area 11. We crossed Yucca Lake and you kind of went through a mountain pass there and on the other side it was a kind of flat in there and they had, from my knowledge, there was four tests that were set up to be done. From what I can recall, only two of them were ever set off.

It looks like two of them say zero.

Well, two were set off, and from what I can gather, they said a slight amount of radiation was detected, but I [00:40:00] don't know if that is because it went nuclear or it just took the material and scattered it. All I know is they said a small amount of radiation was left.

So it was the same situation there. You had to go out and get all this photographic equipment ready.

Yes. It wasn't too many cameras that I can recall, but far as I know, I did it all myself. But that wasn't unusual. I did a lot of projects up there by myself.

So you'd, what, your next in command, your supervisor would say, Vernon, we need you to get out there.

Yes. Les Donovan [sp] was the photo engineer in charge of all the technicians.

I should've asked you this originally, but was there a group name or something that you were a part of at EG&G or just photo engineers?

We were just the Photo Group. I don't know if we had a particular name. I don't remember. Just Field Photo, I guess is what we were called.

And then Les Donovan would say, hey, head on out to such-and-such.

Yes, that's about what it would amount to.

And you'd get in a car and go?

Yes. [Photo stations could be many miles apart.] Boy, did we put the miles on vehicles out there. There was one time I was keeping track of it, putting on 1,200 miles in seven days. There was about a whole month-or-two period, and the reason I remember that is because that vehicle was to be taken in for lube every 1,200 miles. It was like clockwork, once a week that vehicle would go in for lube. At that time they had a lot of vehicles that the site had rented because they didn't have enough of their own, and one of the rental vehicles is what I was driving. That's probably the reason they did the 1,200-mile oil change on it.

What kind of cars were they?

I had a pickup; a Ford pickup, yellow in color. I remember that. [I can only recall using pickups.]

So you would sort of troubleshoot things for them.

Not really. Most of the guys could handle what needed to be done. As long as the equipment was working, they managed to handle it all right. It's just that if something generally went wrong bad, then I got involved in it to fix it.

I see. So if there were something serious, they had to call you in on it.

Yes. Well, they wouldn't necessarily call me, but I'd hear about it and I'd go over there and get it straightened out. So there's probably no record of what I did. I just did it. Did what I had to do and it didn't bother me.

Interesting. I can tell from talking to you, you're a straightforward guy; you do the job that needs to be done. But there was a lot of politics surrounding the moratorium and the stopping of atmospheric testing because of the world situation. Did generally people, or people that you hung around with, talk about any of that stuff?

To my knowledge, I have no memory of any of that. I couldn't tell you. I don't recall any.

So I mean there wasn't, "we should do this, we shouldn't do that," none of that was of concern?

Well, if it was, I don't remember it, I'll put it that way. I have no memory of anything like that.

Now was your job in jeopardy or anything when the atmospheric testing moratorium came on?

I don't know. [I have no memory of being concerned.]

Where did you go?

From what I can remember, I got into another group. I don't remember what they called it because I have about that much memory of what I did. It's a kind of a blank spot in the whole time out there. I don't know what I did. I don't know how long it lasted. But I know when it did end I went over to the Rover project and I worked over there. So there's a time span there, I don't know how long it was or really what I did. [I think it was a mechanical group.]

That's all right. That happens. I think that happens to us all, especially if it's not something you did for a long time.

Because I can remember here not too far back I was trying to put together something of my time working up there, and I got a blank spot here and I can't fill it in.

Well, at least you're honest enough to say that instead of making something up, which is sometimes what happens.

So Rover. What was the deal? What kind of stuff did you do with Rover?

We started out putting the control room assembly together. Now whether that had been used before, I don't know. All I know is the whole building, the control room was redone. I was involved in a lot of the wiring between the equipment and later on as things came together I was working in with the recorders in that second room off to the side of the main room, working

mostly with the recorders, keeping them working and make sure they work and wiring them in and you name it.

Now I've seen those buildings from the outside but I've never been inside. So there was a main building?

[00:45:00] At that time, there was a main building right inside the security gate. They had a mess hall on this side [outside] of the gate, whichever direction that would be. Anyway, and they had the main building there, and then they had the MAD [Maintenance, Assembly, and Disassembly] building was in place. I did a little bit of work in wiring down in that. Then they had the test stand building. I worked a little bit in that. They had a camera station set-up that I pretty much set all that up. It was an underground bunker with the cameras in it so they wouldn't get radiated when the reactor ran up. The cameras were mounted vertical below ground level looking up through a little hole in the ceiling, and there were mirrors mounted up there, looking over toward the reactor. So I did most all of the work in setting that station up and doing everything necessary for it. [Karl Ghericke was involved in making the mirror mounts and their installation.]

So tell me a little bit about how that thing operated. They were getting this reactor ready to run.

Once the things were set up, did you have other work to do out there to maintain it or anything?

Well, as far as the photography goes, they'd have a dry run on that. I'd go out to the station to make sure that all the signals came in, and if it was requested, run the cameras, too. And other than that, between that there was working a lot in that instrumentation room off to the side of the main control room, working with the recorders, making sure they were all working, and basically that kind of stuff. So during the actual event, most of the time, I was in the recorder room just watching over recorders. I can recall on one of the times they ran the reactor up on the road that went down to the MAD building, several of us went out there about a mile and we had a T1B in

our hand. We were going to see what it would read when the reactor was being run up. We would watch the meter needle on it, the needle would go up as the reactor came up to full power, and we could tell because the needle would stop moving. Then as the reactor came down we could watch the radiation level come down. It wasn't very high but we could notice it on our meter when the reactor was running and what level it was running.

Right. Now how big was that reactor? I mean I can get this from the documents, but it was a small reactor, right? Because they were trying to get it to power a rocket at some point.

Well, I don't know the definition of small or large for those, but I would say, oh, maybe from that table to here at the widest, about that square, no bigger than that, the full assembly.

So how big do you think? How many feet would you say that is?

Let me see, this is a six-foot table. Maybe twelve feet.

Maybe twelve feet? Twelve feet square?

Something like that, give or take. Maybe a little smaller.

Interesting. Now in a situation like that, are there more of the scientists and engineers around, other than yourself, in that kind of situation than at a test?

I can't answer that question. I don't know. [I spent most of my time inside the main building.]

I'm asking these kinds of questions because I like to get a sense of what it was like to be there.

We have your story, but what's happening around you and are people scurrying around, are people calm, are people excited?

I couldn't answer that. I don't know. I did what I had to do and I didn't worry about that. [My major job at that time was in the recorder room.]

You're a focused person.

Right.

You're focusing on what you've got to do. But you knew what the point of these experiments were, right?

Yes.

Now how did you find out about that? Was that explained to you when you went over?

Well, it just came about as talk; we got to do this and we got to do that and what we had to do in general to get it ready. So just normal questions about it, nothing detailed. I'm going to give you my personal opinion on that: I think it was a spend-money project.

Tell me why you say that.

Because all the equipment necessary to make that reactor run, you could've never put it all in a spaceship, it was so heavy. They had big hydrogen tanks. Gosh, they were huge! The fuel it took to operate this thing and everything around it was so elaborate to me, you'd have never got it off the ground. Now that's my personal opinion. It'd have never got off the ground, with that technology of that day.

Well, that was one of the reasons I was asking you about the size, because I know that that was the goal, and then you had these big hydrogen tanks and everything else.

Yes, huge fuel tanks. You could've never got it off the ground.

[00:50:00] *So have you thought about what was the motivation if it weren't possible? You said to spend money, to keep people busy? I've heard people say that.*

Well, I don't like to say because I'd be condemning a project. My feeling was they didn't really gain a lot. Personally, I don't think they gained that much with that project. I think it was egos and a lot of other stuff got together on that.

Well, that's your opinion and you were there.

Yes, that's my opinion. It took so much equipment to do what it did.

And being the practical person that you are, as an engineer you're probably thinking, now how's that supposed to get in space?

Yes, how in the world can you get that off the ground? [Are nuclear powered rockets being used today to put objects in space?]

That's very interesting, because it's an intriguing project, the whole notion that you can have a nuclear-powered rocket and they were working on it and everything else.

Now some people have talked about an accident that happened out there. Were you there when that happened?

Yes.

Can you tell me about that?

Well, from what we heard, they had already run the reactor through a dry run condition. After the dry run is over, all hydrogen and other explosive fuels in the reactor are supposed to be purged.

Well, for some reason, some of it wasn't purged, and when they ran it through this test, it ignited.

And there was a structure, I don't know exactly how close or near it was related to the reactor but it kind of blew the building up pretty good. Really destroyed the building.

Were you there at the time?

I was in the control room when it happened.

What was the reaction?

Duhhh! And from what I could hear of people's voices in the control room, it was, what do we do now? How do we explain this? I got the feeling that for the people that were involved, they were at a loss for words.

Well, I mean that must've been pretty intense.

Yes.

So you see the building getting—

No, we're all inside. I didn't see anything. All I know is, I was aware of it after it happened.

I see, because you're inside. Now did things change after that for a while? Was there an evaluation of why—?

[An evaluation, yes.] Changes I could not tell you. I do not know. I wasn't in a position to be involved in that.

Well, we're just about a little less than a hour, so why don't you think if there's anything else that you want to talk about at this point about Rover, then we can take a little break, and then we can come back and move on to some of the underground stuff.

Well, after working a bit on that, they were putting together a new test cell system a short distance away. All I can remember about that is I got involved in putting the new test cell control stations together. That didn't last very long. I don't know what happened, but I didn't stay there very long. It was not completed when I left. They called me over to the test site side again to set up a repair trailer in the News Nob area. I wound up over there with the repair trailer.

This test cell was part of the Rover project?

It was all in the same area over there.

All right. So you started, and then they moved you over—

To start building on the new test cell.

And then they shifted you over to this repair station.

Yes, back over to the test site itself.

What's a repair station?

Equipment that breaks down in the forward areas, it's some place you can send it to get it repaired. But it turned out it really didn't follow through as they intended, as we got very little

equipment there to repair. It turned out we were mostly a cable-making facility, because everybody hated to make cables. Time-consuming and nobody wanted the job. It was considered a low-level job, making cables, so the main thing we wound up making there was cables for everybody else. [The Sedan event occurred during the time I had the repair trailer, on July 6, 1962.]

Now two questions arise from that. One is, what did people do about their repairs? They just did them out where they needed to be done?

I guess. As far as I can remember, a lot of that kind of stuff, to my knowledge, was sent back to Vegas and they repaired it there. I really couldn't tell you where it would go. But they did have a calibration station set up. It was a building right up [00:55:00] behind CP-1. Anyway, they had a scope calibration station sitting up there, so some of their gear I know was going there. If a scope would break down, they could go to this outfit and get another one, a replacement real quick.

But now tell me about cables because that's interesting. What is the deal with making cables?

It's considered the low-level, low-man-on-the-pole, dummy job.

What's involved in making the cable?

Well, you got to put connectors on the ends, and you got to put them on right. These coaxial connectors, there's a knack for putting them together and if you don't put them together right they break down, and you don't want cables breaking down out in the field, period. So anyway, nobody liked to do it so we wound up getting orders for fifty of them and a hundred of them of a given size and we'd make them and that was our major job.

Now did you care that it was considered a low-level job?

Well, hey, I'm given the job, I'm going to do it, is the way I looked at it.

So the cable itself existed and you had to put the connectors on the end?

Put connectors on the ends.

To a certain size?

[Yes, coaxial and multiconductor type cables.] They would tell us how many nanoseconds long they wanted a cable, which is an electrical measurement, so we'd measure it out. We knew what the lengths would be from the figure they'd give us, or sometimes they'd tell us how long they want it, so we'd measure the cable out to whatever's necessary so you would get that and with the connectors put on them.

Explain this thing about nanoseconds. They'd say, well, we want so many nanoseconds and then you'd convert that into the length?

Length. Yes. [For coaxial type cables only.] We had all the charts there, the tables, they'd tell us what the conversion was. And some of it was just standard everyday household two-conductor or three-conductor cable. Power cables, we'd make them, too.

Now is this at the point that underground testing is beginning to come on full force? It must be if you're going back to the test side.

Yes. Everything is underground at this time, because this is in the early sixties, somewhere at that time frame.

Right. So after the moratorium is broken, then you go back to doing that. Interesting.

And the biggest thing I did regarding that station, was on the BREN [Basic Reactor Experiment, Nevada] tower. I can tell you about that.

OK.

All right, the BREN tower was 1,500 feet tall, approximately. It had an instrument elevator that would run the full top to bottom. That elevator had to have a big signal cable going to it. The cable was in two pieces. You come out of the control station. The first cable went up the tower to

the 750-foot level. There would be a junction box there to join the two cables together and then the cable had to drop out of that and go to the elevator. Then as the elevator went up and down, this piece of cable then would go up and down with it. I got the job of making up that J-box. Eric Spiess was the engineer, my boss at that time, [the Atomic Testing Museum has literature from him already, I think], he was the engineer in charge. And he says, Hey, we got a cable to make for this, and he told me some of the details: a junction box halfway up and so on. What do you want to do first? How do you want to do it? I was on my own. So what I did, I says, OK, the big cable reels—they were about six, seven, eight foot in diameter and about that wide and there's something like 800 feet or something length of cable on each one of them. I says, OK, I'm not going to terminate those two cables together at that halfway point up in that tower. Bring me the cables right here to my trailer and bring all four ends into the trailer. They did, and inside that trailer they gave me the junction box, it was a box about 36 inches high and 18 inches wide. Here's the box you're going to splice these cables together in. It was up to me, however I wanted to do it. And since I'd already made enough cables before and had done that type of work before, I didn't have any problem. So I laid out two full height terminal strips in there with different types of connectors on it for splicing coaxes together and terminal strips with the screw terminals on them for regular type wire. I laid all this big cable in there and fanned it all out and did whatever I had to do, right there on the bench, right there in the comfort of the trailer, complete. Then I called Eric and says, Hey, I got this J-box all done. OK, he says, take it apart. I took both cables completely out of the J-box And bagged them in plastic. The trades came to the trailers, rolled these ends back up on the big reels, and took the reels out to the BREN tower. And it turned out they reassembled this J-box up at [01:00:00] that 750-foot level. We didn't have to do it. Originally it was expected that we would do all of this at that spot halfway up the tower, but right

form the beginning, I was thinking to myself, no way are we going to do that up there, because at that height the wind is blowing and it's sandy and it's not comfortable. To have all the equipment that you would need necessary to make all those connections, the tools necessary, if you dropped one of them, forget it. So that's why my decision was we're going to do that right here in the trailer, and that's where it was done. And I probably did 99 percent of all that right there in the trailer myself. I didn't ask the other guys to do it, because mostly what the company would do, they would take new hires, while they have their red badge. I would get them in my trailer [until their clearance came through], which means their experience for most things was kind of on the lacking side in a lot of ways. I'm not trying to degrade people but I mean that's the way it was. So I took it upon myself. I did probably like I say 99 percent of this J-box by myself.

[At the time of the interview, to me, the BREN tower cable just happened to come along when I had the repair trailer and the place to do it. At Rover, it was more like you're going back over to go back over to set up a repair trailer at News Nob and that was that. I immediately went back. The trailer was already there having been previously used by the warehouse group. So the cable may have been the reason I was brought back from Rover. When it came alone, Eric gave me a brief description of what the cables were for, then asked me what I wanted to do first. After that, everything I did on this project I did as I saw fit. Not once did Eric ever question anything I did or wanted. After the J-box was installed in the tower, I terminated the ends in the elevator and their control room. I also did some terminating on their system instrumentation cables. But I was not present when the final cable terminations were done or instruments were installed so I never saw any part of the control system in operation.]

Well, it seems like on something as important as that, you have to get it right.

I didn't want any errors in it at all. I consider myself a perfectionist in a lot of ways. I feel you do it right the first time, then you don't have to do it over. You got reliability, which I always had that problem trying to convey to other people. They're not interested. Try to make a neat job out of it so it looks like it was made by professionals because to me the more professional a job looks, probably the better the quality is going to be also. That goes together. So I took it upon myself to pretty well do the whole box by myself.

That's so interesting. I have a couple of questions that that's raised. The junction box, you would say, was what, three by—?

Yes, about three by—

By two [feet] maybe?

No, it wasn't that big.

Eighteen inches maybe?

I'd say about eighteen, approximately, give or take, wide.

And that's the junction for all these cables.

For the cable that goes up and mounts at the halfway point, then the other one drops out of it. [It was just the two large multi-conductor cables, I'd guess about two and a half inches in diameter each.]

Now it sounds to me from the description of this project that you pretty much visualized how you wanted to do it ahead of time. I know I'm asking you to go way back and give me a time frame but give me a sense of how long it would take you to put that whole thing together on your bench.

I have no clue because it wasn't a continuous job start-to-finish. It was when time permitted, pretty much, because I was running the trailer so I had the phone to answer and all this other stuff, so it was kind of in between everything. But to me it was a job, don't leave it sit there for

later, you get time, you work on it, and you get it done. And when I got it done, that's when I called Eric and says, I've done all I can. And they were still working on the tower. There was still plenty to do out there yet. So when I got it done, it was not a delay for anybody. They just hauled it out there and did their thing. And then after it got out there, I did a lot of the terminating in the control station at the bottom there, not all of it because they weren't sure where all their equipment was going to be and what it was going to do yet. I terminated all that I could that I knew about and what they had ready for it at the time. Then [in] the end that went into the elevator itself, I'm not sure if I wired that totally—I know I wired most all of it because there again they weren't sure of all the equipment that was going to go in the elevator. So as they came along with what they need and they knew, I wired the J-boxes. And a time frame, I couldn't tell you what the time frame was. [A total guess would be no more than three to four weeks in the trailer.]

That's OK. But your answer was great because you were doing all these other things and you took this on and you put it together, which is interesting. Now did you see the BREN tower in operation then at some point, or your piece is done?

I'm trying to think. I think they did get it into operation, I think it was to a small scale. I really can't answer that one because after it was all together, I was doing other things up there. I got into vacuum systems, worked that, and then gas sampling, I got into that and lost track of that the tower operation, I know at some point they took the tower down and moved it.

Right. So I'm going to stop, and then I want to talk for the rest or at least for the next little while about the vacuum systems.

OK.

So we'll stop and take a little break.

[01:04:26] End Track 2, Disc 1.

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

Recording resumes mid-sentence

—comical thing, it wasn't related to the job. There was a small service elevator in the BREN tower, supposed to be one person. And this other kid, Clarence Chappell [sp] was with me. He goes out there—no, not him, Rex Lundberg went out with me. We got to talking to the crane operator. He says, Hey, you guys want to go up in the tower? [And we said] Sure! So the two of us squeeze into the one-man elevator. This other guy, he gets behind me and he's up against the wall like this [demonstrating] and I'm in front of him like this and they got the door shut. And the operator, he climbs up on top of the elevator, he's holding onto the support cable, and he's got the radio, telling the operator down on the ground, Ready to go up. So we go up to the 750-foot level. He says, This is where your J-box is going to get mounted. He opens the elevator door and I look down. Boy, them people down there look little! I got out of the elevator and walked the framework around that tower. Didn't mean a thing! When I was walking the framework I looked back at Rex in the elevator and he's standing there like this [demonstrating] and only his eyes were following me around. His head never moved and he had a grin from ear to ear. He was paralyzed. [I'd say he was paralyzed to the limit.]

He's plastered.

Oh, if there had been a hole that big in the back of the elevator [demonstrating size], he'd have fallen through it. I got back in the elevator and I'm smiling and laughing because it didn't bother me in the least.

So it didn't scare you. Interesting.

No. And I'm walking on the beams going around, just holding onto the framework of the tower.

Unbelievable.

And it didn't bother me a bit.

So the elevator goes to 750 feet?

I have no clue how high the elevator would actually go. He just took us to the J-box point and he says, There's where your J-box is going to be. There was no work platform or nothing there. I'm sure they put one in later, and probably later they did, but at that time there was nothing.

Wow, that's high. Well no, any other time you think of any little story like that that you want to tell me, tell me. We don't have to stay officially on a time line.

Well, I was planning on a lot of that, just putting it in writing and sending it to Vanya and she would distribute it to wherever it would go.

Yes, but if you think of any now because then the nice thing about that is we type it up for you.

You don't have to worry about writing it. So these are the stories that give a real flavor, so anything like that that you're thinking of right now, go ahead and tell it.

Well, I'd prefer to do it on my own because then I can think about more details to add. I'm one of them guys, my brain don't sleep and that's a problem. It goes twenty-four hours a day, and it's irritating. If I'm doing a project and I run into a problem, I don't like the way it's going, I'll punch it into my memory and go do something else. It may be a day, a week, or several months down the road, and all of a sudden I'll wake up in the middle of the night, wide awake, I got the answer as to how I want to do it. There will be the answer and I'm smiling and I can't go back to sleep, so that takes care of that for the rest of the night. That happens all the time. It's like a lot of this stuff I'm putting in writing, it's taking me so long because I keep coming up with more information. Hey, that belongs in there, too! So I'll write it down I won't forget it and I'll put it

with the other literature I got. So that's the reason I'd prefer a lot of this to do it that way, in writing.

Whatever you want to do.

Because there's things that have happened at the site, a lot of times I'll think about them and I'll write what I have to put down there and I'll type it up and darn! Something will come to me I should've put in there, so I start all over. So I'd prefer a lot of these little episode stories to—in fact most all the stuff I would kind of like to do it that way because memory just won't kick it all out at the same time.

It won't. And probably when you're reviewing this, other things will come to mind. And I'm perfectly happy with having you type up a little extra. We can put that in there as well, so that's fine.

So we talked about, you said about this vacuum situation, but let's talk a little bit about underground testing first. You're making the cables and then you do the cable for the BREN tower.

This other cable stuff was little short stuff that the instrumentation stations wanted. We were just making it for them because that's the low man's job and they're not going to take the time [00:05:00] and degrade themselves making all these cables. I know that was a big part of it.

But it takes everything to put it together.

Yes, you've got to have them.

Exactly. So what sort of naturally comes next to mind as something that you worked on that you want to tell me about?

Well, the next thing I got into after the repair trailer shut down, I got into the T&F system for a while. Well, let's see, no, I was making cable diagrams for the whole site. Out in the forward

area, at that time everything, all signals were on cable. There was no radio communication for signals at the time. So I was putting together wiring diagrams that showed where the cable left from, where it went, how many J-boxes it went through, how it got there. I was going over the whole site out there doing that. And it turns out there was a lot of the cabling that no one had ever really put drawings together on or if they had they lost them. So I was the only one making complete cable drawings and I was coming up with how stuff got there that nobody else had the faintest idea about. All the cables that were running all over the CP-1 building, most of them nobody knew where they went once they left this J-box, how they got out to this other one over here. So I spent quite a bit of time tracing cables out like that, and it was rather time-consuming. I was out in the field and showing on drawings, here's the road and here's the cable and how many conductors in there and here's the J-box and the number on the J-box, so I spent quite a bit of time doing that. [I made complete wiring diagrams for most of the J-boxes also.]

Now do you suppose those documents are still somewhere in EG&G's archives, of that kind of work? That sounds so interesting.

More than likely.

Yes. Maybe I'll try to see that.

Because when I left doing that job, I had a notebook about that thick for records.

Several inches thick.

Yes. Anyway, I had a lot of records in that notebook. I had shot locations and a lot of them I think I had dates when the thing went. I think a lot of the data I had in that book wasn't really necessary, but I was putting it in along with what I was doing.

Yes. That would be so interesting to see, wouldn't it? It would be interesting to me.

Probably. And I have no idea where that book went.

I can look. I mean it went somewhere in your organization.

Yes, I left it there on the table. I says, I'm going into T&F. There's what records I had.

There was a lot of cables that were up on the mesa. They wanted to know how did they get where they're going, so I had a lot of that written down.

Interesting. Now who did you do that for? Who was your boss at the time?

I don't remember.

I'll see if I can do a little research on that. I think that'd be neat.

I'm not sure. It might've been Bernard Murphy [or Mark Alton]. Maybe.

It could be that that stuff is still classified, too. I wonder.

I doubt it.

You doubt it? Cabling?

I doubt it.

I'll see what I can find out. That would be interesting to see.

So after that, then I got into the T&F system. Didn't work the control room part. I was out in the field because every time you'd have a shot, you'd have a timing station out there, and it was making sure that when the signals came in, that they were distributed to the proper trailer or building that the cables were all put in.

How interesting! So that would change, depending on what the test was, where those cables would go.

Yes, every shot was different. The timing station would be moved in and then you'd have to get cables run. Now the electrician generally ran all the cables but we had the records of them as to which pairs went where and what they were used for and made sure the timing station operated

like it was supposed to when the signals come in. That only lasted I think maybe a couple of years.

And this is for the drill holes, the tests that are taking place in the drill holes?

Yes. And I even got involved a little bit on one of the shots in Area 16 the military was putting on, at 16 Tunnel. I was up there a little bit, not very much.

So the tunnels as well then.

No matter where the shot went. It didn't matter. This was all DoD-related. See, there's two outfits were shooting up there, Los Alamos and Livermore.

It was Livermore-related at that point.

Yes, to my knowledge it was Livermore-related. [I worked DoD-related shots only when in the T&F section.]

That's good to know.

I didn't do anything in Area 3 where LASL [Los Alamos Scientific, later National, Laboratory] operated.

So those are two interesting things, and it's something that when you're thinking about the physics and all these other things, you're not necessarily thinking about physically how do those cables get there to get all this information and who knows what's what.

Because I know there were some records, probably still around, on all the major cables, but a lot of the smaller cables run to here and there to some user. There just weren't any records on them, [00:10:00] at least not that they could find or take the time to find.

Why do you suppose that was?

"Don't care." It's a "don't-care" attitude. From some of the stuff that I can recall hearing, people would make the drawings and here they are and nobody cared after that. We don't need them

anymore, the shot's over. So they wound up in this stack or that stack, and the next thing you know, who knows where it went? You know about that probably.

So then what? What other kinds of stuff did you do out there?

I worked Area 11 during the above-ground testing. Going back on the above-ground testing, they had the big tower, 700-footer up in Area 8. I've heard two names given that I'm not sure the records indicate which one was which. Some called it Smoky and others called it Hood. It was at two different shots, two different times, and I'm not familiar with that.

Let's look right now.

Because the one I was on had to be in '55 or '57. In some of the literature that I've come across, the way it's written, I'm not sure that the name they're giving is the actual shot they're talking about.

Hood was a balloon shot in 1957 in Area 9.

OK, Hood, well, I was probably on that too. So the tower was Smoky.

Yes, I think Smoky was the tower.

OK. I worked that one.

Yes. We're going to look at Smoky now. Smoky was in August '57: Livermore, a tower.

Yes, it was a Livermore shot. That was a 700-footer.

Right. And it was big. It was 44 kilotons.

We were told 100 Kt.

Well, this is what the book says.

Yes. That's the information we got, it was 100. And it had to be a big one because from what I can recall, the fireball took the tower right to the ground. So I don't know if 44 could've taken a 700-foot tower to the ground or not. And I know the hill behind it, all the vegetation was ashes

after that shot. They show a picture of an underground bunker, they show the picture and a little bit of a stairway. And some of the literature I've come across, the way they describe it, to me, that bunker was the Smoky shot, but I get the feeling, the way it's written, they're putting that on Hood. There's a confusion factor.

I see. And that very well could be. There's either confusion or it's on purpose for some reason and we just don't know. So you're saying you see a bunker that you're pretty sure was related to Smoky.

Yes, because I was in that bunker, and the picture looks like it was the one I was in.

So you were in that bunker when the shot went off?

No, nobody was in the bunker to my knowledge.

Of course not. That was—

No, it's too close to GZ [ground zero]. Because I remember going in that bunker and as you went down the stairs, to me the shot end was here, was over this direction when you went down the stairs, and if you made a left turn, there was a blower [exhaust] assembly hanging there on the wall. You manually would turn a crank to draw air into or out of that room. Hand crank on it. And I remember that in that bunker. That bunker picture on the surface, to me, is that bunker. Now maybe I'm wrong. They looked so similar. [I've been thinking a lot about the fan operation. I very much now doubt what I was told about its operation and what I said on the tape was accurate about how the fan operated. At the time I saw it, much work was still being done in and around the bunker so I never did see it in operation. It was where I saw it and it did have a hand operated crank on it, that I can still remember. The part about drawing air into or blowing air out of the bunker I no longer believe to be true.]

And what was the purpose of the bunker?

I have no clue, but it looks like it was apparently a fallout-related condition that you could get in, in case of a nuclear shot. But to me I didn't see quite how it really fit. Here you got an exhaust fan hand-cranked. If you're in a radiated area, that ain't going to do you any good. So I don't understand the reason for that fan. [The fan use was told to me by others. I never saw it in operation.]

I really don't know. What I know about Smoky is that it was big. That's what I've heard about it.

Yes, like I say, they told us 100 Kt.

After it went off they told you that?

No, this is the information we got while we're setting the stations up.

Oh, while you're setting the stations up. I see.

They had water tanks set up there, simulated sizes about so big. They wanted to know what the shock wave would do when it hit water tanks. They had some tanks that were about that high and about that big around.

Just for the tape, so we know what you're saying, about how many feet high, would you say?

[00:15:00] Two-and-a-half feet. Maybe three at the most. And maybe six, seven feet in diameter.

They had a big steel I-beam sticking up in the ground with an Eastman camera mounted on top of it, looking down at it.

At the water.

At that tank, yes. As far as I can remember, there were several of those tanks because I know because I had to mount the cameras up there and put film in them.

Interesting. And so you were where when the shot went off?

Back at the CP. At that time everybody would evacuate to the CP area. They had the road blocked there at the bottom of the hill near where the airport road was. That's about where everybody got cut back to.

So did it look large to you when you saw it? Again my questions—

I don't remember.

Yes, that's a layperson's question, like can you tell the difference between the different-sized tests?

And here that was like twenty miles out. And in a way, you don't worry about size. I didn't worry about size. Hey, it went. There's another one down.

Yes, the success of the test itself.

It was successful to my knowledge.

Right. Interesting.

And I'm thinking that was the test when I mentioned about driving through the radiation areas, the way we had to—no, that couldn't have been that shot. I don't remember where the photo stations were for that one now.

That's understandable.

Because normally we had three mobile stations on every shot, plus maybe a Brock house or two. And then of course when they did the tunnel shots, we had photo stuff up on top of the mountain. We had one little station, it was a Brock house mounted on top of a great big huge rock. It had a stairway going up to it because the rock was so big. I manned that for that whole shot.

Now tell me about that. So you would be photographing what from outside?

What they did, they had a system set up to see how high the top of the mountain would lift at zero time. They put like a big billboard-type screen up out there, huge, and it had lines and

squares all marked on it and they're all identified. They put a big tall power pole up behind it; suspended on a big long spring was a big ball weight hanging on it. And what would happen is, when the shot went off, the billboard would raise, but the ball, it would take it time before it would move. And they got cameras. Our cameras were back there taking pictures of that. So the camera shows that the big billboard-sign thing would raise, but the ball would stay still, and they could see by the markings on the billboard, how much the board raised, because it took time before the ball would respond to the stretch. They figured it takes place so fast, the ball will be there and the sign raised this high, and there's how high the ground lifted, then. Crude, but hey, it worked.

And that's above—

On the mesa above Area 12.

On the mesa. So it's above a tunnel.

Yes, we're directly above a tunnel.

So that one of the things that they would photograph from outside.

Far as I know, that was the only station I worked on that shot. We may have had cameras looking at the portal. There probably was but I don't remember much about that because I was doing the—Tiny Pine Lodge, we called it.

What's that?

This wooden Brock house building.

Oh, you called the Brock house Tiny Pine Lodge?

Yes, we called it Tiny Pine Lodge. As far as tunnel shots go, that's the only station that I can recall working at that time. There was another station up there further back. I don't know what

that station really was doing. I didn't operate that one at all. It was a big garage structure and there was about five or six cameras in it; I think Jim Freedman was the one that ran that station.

Now one question that comes to mind—all this time now within the EG&G organization, what is your position at this point?

Technician. At some point the lead technician came in and the senior technician came in way back then, but I was still doing a whole lot of the engineering on the stations and that was never in the record. Setting the stations up, being responsible to get the whole station set up. And another [00:20:00] thing that was happening is that most of the help that we would get, a lot of it would come out from [EG&G] Boston. It would turn out that some of the people that were coming out from Boston were not qualified really to do anything but be a pair of hands. So a lot of them, to me, were nothing but a pair of hands standing there. And they'd work, they'd do what you asked them, but as far as being a person responsible to see that everything worked, forget it. A lot of them didn't care. They were there because I guess they wanted to come out to the site and see what was going on. Then the company would send them. But as far as their actual value would go to participate in something, it wasn't there. And you probably don't want to hear that in the record either.

Well, I don't know. I think it's an organizational problem that manifests itself in many organizations for different reasons. What is your thought on it? Was it a generational thing? Do you think it was just a personality thing, a training thing?

I think that they needed—people had to go out there to get the job done and you needed a certain number of people, so these people were the fill-in. We had one particular shot: Bob Morris was the senior engineer for the actual photography on that. Les Donovan was the engineer back in charge of the group. I was working the Frenchman shot and the kid they had working with me,

that kid, he knew next to nothing as far as operating that station. One of the things that was comical about that—the stations were all battery-powered. We had 6-volt car batteries making up 120 volts, two banks of them. We had to put the acid in them, and I had him putting the acid in them. I says, Don't spill it on your clothes. Typical kid, he ignored it. He got it all over his clothes. Come back in the next day and he said, You know that pair of pants I had on yesterday? The legs are gone. I said, I told you not to get it on yourself.

But anyway, later on I was back at the CP and was getting ready to head out one morning and I was going to go out by myself, and Bob Morris says, Here, take So-and-So with you.

I says, I don't want him. He's worthless.

So I walked away and was going to go out, and Bob says, You could get in trouble over this.

And I said, So? And I left. But I didn't want the kid. He was so damned worthless. And that was not unusual at that time.

And this is in the, what, the sixties era?

No, this was during above-ground testing, and I'm pretty sure that took place on the Priscilla shot, what I just told you.

OK, so we're in above-ground.

Yes, Priscilla. Got some stories to tell on that one, too.

Why don't you tell me some?

Well, all right. I sent in a piece of paper on one of the photo stations. It was way out—in some of those areas the electricians and all weren't sure really where they were at, and the people that drove our mobile vehicles out weren't sure where all these stations were. So I knew enough about the area that I was given an approximate direction from Les Donovan as to where it's at, so I went out there looking for it and I found it. I could tell it was it because of the way the pad was

poured and there was a J-box there and it had everything to tell me that was the spot. But it was not identified with any number or anything, so I took a piece of paper and I wrote on there F-something-or-other, [the "F" probably stood for Frenchman] the station location for that shot. I taped it on the J-box. After the shot we went out there and here's this piece of paper there and the letters, black is all burned out in them. I recovered it and I gave it to Vanya, that piece of paper. She has it.

You did. And that's from the Priscilla shot?

Wait a minute, I should say that shot on that piece of paper. I really can't say for sure. [But I'm pretty darn sure the more I think about it.]

All right. From that era.

But from that era, I did that, and she's got that piece of paper.

I would like to look at it, that'd be neat.

And the letters are all burned out in it. And probably somebody that knows enough about that area and the records, that number [should be on the film records] would tell them exactly where that photo pad was located.

Right. How interesting.

And the vehicle that was out there after the shot went, they had canvas tops on them because you had the back gates of the vehicle open. When the shock wave came in, it would take the roof off, normally, so we had the canvas that was on the top. We'd take the ropes loose up in the far end of the vehicle and we'd tie it down with lightweight cord, so when the shock wave would come in, it could snap the cords and go on out the front of the vehicle. There was one of the vehicles, it may not have been that one, but one of them I remember the canvas on the roof caught fire. The

heat from the blast itself set the roof of the vehicle on fire, and before I got there the fire people had gotten out there and put it out.

Now why would the vehicles be left out there at that point?

Photo purposes. It was a photo vehicle.

[00:25:00] *It was a photo—thank you.*

Yes, I forgot to tell you that.

That was an ignorant question on my part but I wanted to make sure.

No, it wasn't, because I didn't tell you it was a camera station.

Yes. So you had equipment on that vehicle.

Oh, yes, it was loaded with all the necessary cameras and stuff. But it was not unusual to see sagebrush and all spotted around the ground zero area burning.

Right. Interesting.

And I'm going to add something else on that Priscilla shot that probably somebody isn't going to like. They had some metal structures—they had the posts and a roof on them—and after the shot these things are all laying over. They had put hinges on the bases of these posts where they were anchored to the ground so they would fall over. Have you heard this before?

No.

There were hinges on them. And I know because I saw them.

So what's your point? I'm not sure I'm following your point.

It was a put on. It was a publicity thing apparently, that this building had to go over, so they hinged the bases on the posts so they could easily go over.

And I'll tell you another one at the same shot. They had some military vehicles out there sitting around to see what the shock wave did to them. They torched the spring shackles on these

vehicles so when the shock wave hit the vehicle, it would go one way and the wheels would go another way.

So you're saying they were staged to a certain extent?

Yes, they were staged. Part of that was staged. Now those are the only two things that I know that was pulled. And I'll probably get in trouble over saying that.

All these years later, I really doubt that.

But anyway, it was like I said earlier, if anything I say doesn't want to be put in the record, feel free to take it out because of security or whatever, I don't know.

Yes. I wouldn't worry about that. If we're worried about it at that point, I think my view would be that at this point in time, whatever problem there would've been with that is over. We can check that out. When you read the transcript, if you have concerns, you can let me know. But I think that that's interesting because all of us are looking at those and saying wow, this happened and that happened, and God knows those weapons are dangerous enough.

Oh, yes. And getting back to the above-ground, another shot that took place, I'm pretty certain it was Area 1, Operation Cue. Are you familiar with that one? Anyway they had all those houses, wood structures, brick structures, block structures, wood. I worked on that pretty much all by myself again, setting that up. [I worked only inside the test area.]

Doing what?

Photo. Setting up field photo. Now there were other people helping me some at times, but for the most part I did the majority of that by myself. A lot of the cameras were mounted on a tripod, small cameras. The camera was called by letters GSAP, which stood for Gunsight Aerial Photography-type camera. It's a little bitty thing, run on 24 volts, had a fifty-foot roll of 16-millimeter film in them. These were all over the place, taking pictures of all these different

structures. And I'm pretty certain that is the type camera that took the picture of the two-story white house and it burned and then the shock wave hit and put it out. I'm pretty certain I set that camera up.

That was going to be my next question.

I'm pretty certain I set that camera up and recovered the film afterward.

Interesting. So some of that footage that we're seeing in the films or even now in the museum of those places burning, you were involved in setting those up.

Yes. On that particular shot. That's the only shot that I can really recall at the test site using that type of camera. Most were mounted on a tripod and it had a big heavy lead lid that would go over it to protect it from radiation. Had a battery pack; they're dry-cell batteries that the camera ran on. And I think I have a picture at home, on the 4,700-foot line, there was a two-story brick house. And my family don't want me to let that picture go if I ever find it, it shows that house. And I took it with my own camera, since that shot was kind of an open thing and we could take all kinds of pictures anywhere we wanted, I took a whole bunch of pictures there, and now can't find a one of them.

Oh, dear. Now did you take the one of the brick house?

No, somebody else took the picture I can find. That was a regular photograph. [Yes for the picture I cannot find.]

OK. And was that before or after the—?

Before.

Before the shot.

Shows the house before. And we still wonder what in the devil we did with those pictures.

I bet you'll come across them.

I hope so. And I still got the camera that took all those pictures.

What kind of camera is it?

Little [Kodak] Brownie Hawkeye. Still got that little devil. And there was another picture I took [00:30:00] on one of the shots, I think it was an Area 7 shot. I was up at Station 372 watching this thing go. It was one we could take pictures of, pictures of what we wanted. So since I didn't have goggles to wear, I just kind of [demonstrating] stood up like this, the shot was back there, so I held the camera right here.

And faced it backwards.

And faced it back that way, and when I saw all the ground light up out here, I clicked the picture.

Wow. So you held it sort of at your waist and then just—

Yes, just put it right there and held it, and I figured, well, that's about it, and got a pretty darn good centered picture. Now that picture I can't find either.

That's got to be frustrating.

Yes, it is. It was just a little white dot, actually, on the film, is all it was, but it got it.

And another incident that happened there that was comical—it was a kid, he was a photo bug. He had bought him one of these, it must've been about a \$400 camera at that time. He had a little tripod about that tall, he had the camera set on that, and he had it all ready to go, and when the shot went he was so excited, he pushed so hard on the button, he knocked the camera off the tripod. Chester Smith was his name. Oh, was he mad! And that was a big joke I used to pull on him. I says, Here with my little Brownie Hawkeye I got a picture and your camera, you blew it.

Well, you know, as far as letting pictures go, the neat thing with technology today, say that brick one, is you can scan that thing. You can have someone with a computer scan it.

Oh, yes, there's no worry about getting copies of that one.

Copies is fine as long as your family wants to hold on to the original but, you know, that's neat that you have that.

But my feeling is so much of this, if family holds on to it, to me, down the road, most of it's going to go in the trash can. I don't like that. But they kind of feel they should get all this.

Yes, as I said, that's not unusual, and it's something you've got to work out.

And I'm stuck in the middle.

But it's not an unusual situation. You know, I apologize, I don't have that much more time because I have other obligations. But if you could talk to me for maybe—because we've alluded to it and you mentioned it yesterday, maybe five minutes or so, just to give me an understanding, and this isn't going to be sufficient, of the work you did in the vacuum systems in the tunnels.

Didn't you say that you worked on that?

Yes, the vacuum systems in the tunnels and some of the vertical shaft ones, too. We had vacuum systems on those that the vac pumps went down hole.

Right. Now just for an overview, what was your involvement in that kind of—?

Setting up the pumps wherever they may be located and making sure they would run. And then on some of the events we had the winch control with the ball valve at the top of the hole, because they had the line-of-sight casing going down to the device and as soon as the device went, they had to close the pipe to keep blast debris from coming out. We had a ball valve near the surface to operate. I was involved in setting that all up, the signals on it, and making sure it worked, and the monitor on it told them it closed and all that bit. I got involved in setting all that kind of stuff up. And also on these shots, the winch was run from the CP. There was some little radiation data recovery stuff fastened to the winch cable not very far down hole, and after the shot went, it had to be recovered out of the pipe, so the winch then had to be turned on. This ball valve was not

closed until after the winch pulled the cable [with its sample on it] through, this ball valve I'm talking about. They would operate the winch and pull this sample up past where the ball valve was, then would fire the ball valve [explosive bolts were used] and close it to seal the pipe off from all gases and all that may be in it from down below. Then afterward they'd come back and get in the top and recover that little cylinder and it would give them data from whatever the blast did to that sample.

Right. To a layperson it sounds incredibly complex and that you had to have the timing on it really precise.

Well, the winch would be run after the shot, so further down the casing they've got other closure doors that are supposed to operate but I never got involved in those. They had explosive bolts in there that they would trigger to close these doors. And those doors were supposed to close as soon as the shot went, but most of them didn't get closed in time and the debris would get in them so the doors couldn't close, so radiation would get way up in the pipe. All I got involved was with the operation of the winch, getting it set up and making sure it all worked proper, and this ball valve up on the top, making sure it did what it was supposed to do and when and all that bit. But the winch was run after the shot went, and this ball valve would be closed after the winch pulled the sample up through it. [This was part of the PINEX system.]

So it's to get the diagnostic stuff out.

Right, the winch pulled it up. And how far down that sample was, I have no idea because that [00:35:00] wasn't my job. Other people handled that. The mech techs worked that. So I was involved in setting up the winch and the ball valve controls only. And then of course it had vacuum systems on top of that.

And later on, another shot we got involved with—they had some other radiation detection stuff down there. They started getting a computer system in it, to do what they had to do. I was in on the beginning of that, and that darn computer system, that thing kept crashing on me! Here I am, I was out by myself, trying to get all this other stuff set up. It was a shot that was different from a whole lot of the rest of them in what was required, and I'm tearing my hair out trying to get it all put together. Every time I'd set this computer system up on the diagnostic part to run it through, the thing would crash and lock up. That's when you had the baud rates you'd set and you'd start over and you turn it off and you turn it back on and you punch in a whole bunch of stuff and the thing wouldn't come back on. And out there, well, you'd have to call into town and tell them the thing locked up again. The guy would come out the next day then and he'd go through it and he sat there sometimes, I think for an hour, trying to get that computer bug, whatever got locked up in it out. He'd finally say, OK, there it is, now it works. And it happened so many times that here I am by myself, I kept asking for help, and finally they send a guy out to me, he's nothing more than a pair of hands—you know what I was telling you about, they got these people, they send me a pair of hands. I'd spend more time trying to tell him how to do a job than if I'd have done it myself. And I'd leave the trailer to do something and I'd come back, he's sitting there on the phone. That's all he wanted to do was talk on the phone. Then of course they finally got rid of him and they send me another guy and he was more interested in learning but he didn't have the knowledge for it.

It sounds to me at this point, having been there from '55, that not only do you have the ability to pick up the new technical knowledge but you have incredible decades of on-the-ground knowledge of how things work.

There was nothing they could throw at me at this time that I couldn't handle [except for the above-mentioned computer]. And the lab people, now I shouldn't say this but anyway—ah, I'd better not say. I'm going to make an enemy. But a lot of it, the lab people would come directly to me to get projects, little things set up and done. Generally always I'd say, well, if I add this to it, we can do this, and then if I do this, we could get some more data this way, and I'd always give them more than they wanted. I'd do it every time. I figure if I can do that with very little ease, why not? So I'd do it. If they wanted it tomorrow, I'd generally have it in the morning; I'd have it all ready for them. I'd never make them wait. I always had it is, if there's work to be done, you do the work first and hopefully you do it right the first time. We goofed off afterward. Because out at the site, when there was nothing to do, you could sit there, no matter who walked in. Nobody cared. But I always had it set up so if there's work to be done, it comes first.

I hate to have to end this but I do have to. But let's just say hopefully to be continued. You've given me a lot of really wonderful information.

Well, I figure that because I was right in the middle of it.

Yes, it's great. So thank you very much.

[00:38:48] End Track 2, Disc 2.

[End of interview]