

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

Interview with
Raymond Harbert

October 20, 2005
Las Vegas, Nevada

Interview Conducted By
Mary Palevsky

© 2007 by UNLV Libraries

Oral history is a method of collecting historical information through recorded interviews conducted by an interviewer/researcher with an interviewee/narrator who possesses firsthand knowledge of historically significant events. The goal is to create an archive which adds relevant material to the existing historical record. Oral history recordings and transcripts are primary source material and do not represent the final, verified, or complete narrative of the events under discussion. Rather, oral history is a spoken remembrance or dialogue, reflecting the interviewee's memories, points of view and personal opinions about events in response to the interviewer's specific questions. Oral history interviews document each interviewee's personal engagement with the history in question. They are unique records, reflecting the particular meaning the interviewee draws from her/his individual life experience.

Produced by:

The Nevada Test Site Oral History Project

Departments of History and Sociology
University of Nevada, Las Vegas, 89154-5020

Director and Editor

Mary Palevsky

Principal Investigators

Robert Futrell, Dept. of Sociology

Andrew Kirk, Dept. of History

The material in the *Nevada Test Site Oral History Project* archive is based upon work supported by the U.S. Dept. of Energy under award number DEFG52-03NV99203 and the U.S. Dept. of Education under award number P116Z040093.

Any opinions, findings, and conclusions or recommendations expressed in these recordings and transcripts are those of project participants—oral history interviewees and/or oral history interviewers—and do not necessarily reflect the views of the U.S. Department of Energy or the U.S. Department of Education.

Interview with Raymond Harbert

October 20, 2005

Conducted by Mary Palevsky

Table of Contents

Introduction	1
Recalls Operation Castle and describes Bravo and subsequent recovery efforts on Bikini and surrounding islands	1
Details post-shot effects of Bravo and feelings about the immensity of the test, compares high-yield shots such as Bravo with tests observed at the NTS, mentions rivalry between LLNL and LANL	7
Mentions meeting Admiral Hyman G. Rickover and talking about development of nuclear submarines	9
Talks about military application of nuclear weapons, concern about Soviet development of weapons and the Cold War, continued work on smaller-sized, higher-yield weapons, disagreement between Edward Teller and J. Robert Oppenheimer over development of hydrogen bomb, and Plowshare	9
Outlines chronology leading up to claim filed against the AEC for injuries during Bravo and describes his role in that and regret for what happened to victims of testing	11
Talks about resettlement of native Marshall Islands people and damage done to the islands as a result of testing	12
Muses about lack of respect by United States as a nation for other world cultures and about responsibility of U.S. for mistakes made in testing in the Pacific	15
Tells of condition of Marshall Islands and inhabitants today	16
Conclusion: Reflects on career as engineer, accomplishments and regrets	17

Interview with Raymond Harbert

October 20, 2005 in Las Vegas, NV

Conducted by Mary Palevsky

Also recorded on videotape by M.T. Silvia, Smartgirl Productions

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

Mary Palevsky: *Ray Harbert, I want to thank you very much for speaking to me again.*

You've been so generous in your sharing of your recollections and your expertise. I know that you and I talked the first time we met about your early career and about your experiences in the Pacific on Bravo, but I thought it'd be good to go back and talk about that a little more, and then fast-forward to when you went to the Pacific again for [Operation] Hardtack [I] briefly, and then for when you went back in '72 with the question of what you were just telling me about the resettlement of the islands.

Raymond Harbert: That'll be fine. It's a pleasure. I enjoy sharing what experience I've had. It's recorded for posterity.

Right. So you were with a company called Holmes and Narver as an engineer?

That's correct. I was resident engineer for Holmes and Narver on Bikini during the [Operation] Castle series. That was a series of about seven shots, a couple of them based on islands but most of them were barge shots. And the first detonation on that shot was Bravo and it occurred on March 1, 1954. And we had buttoned up the islands. There was a lot of problems. There had been an LST [Landing Ship, Tank] that had problems when it came in to offload a lot of equipment. We were trying to get rid of salvageable equipment that was on the islands prior to the detonation so they could be used for future tests. And unfortunately it got hung up. It was an LST and it came in to Tare and hung up on the island and they had trouble getting it off. And we worked for about three days trying to get it off. And all of a sudden from the flagship we saw the

signal going and the admiral out there said, *Captain, you will be off at 1000 hours this date, period*, signed, the admiral. And we got some bulldozers out there and some tugs and we finally pushed her free as the tide came in.

And that was the beginning. From there we moved onto a fleet of ships. There was the [USS] *Estes* [AGC-12] and the [USS] *Curtiss* [AV-4] and the [USS] *Bairoko* [CVE-115] (*Bairoko* was an aircraft carrier) and the [USNS *Fred C.*] *Ainsworth* [AP-181] which was a troop ship, and I was on the troop ship. And because I was one of the senior people, I was fortunate enough to have a cabin; I wasn't down in the bunks with some of the others. But it gave me an advantage because I was with the scientists and I could listen to their planning and what they expected.

On the day of the detonation, I was up on the bridge with some scientists from Los Alamos Scientific [now National] Lab and we were instructed over the loudspeakers to put our glasses on and get ready for the test. And we heard the countdown. And we were warned not to remove our glasses until such time as they said it was OK, as the intensity of the light from the explosion diminished to where it would not damage our eyes.

So we were there and we heard the countdown and we saw the flash with our glasses on and everything else, and finally they told us we could take our glasses off. And at that time you saw the mushroom cloud developing and rising, and it was huge. And as the mushroom cloud developed, what we saw was iridescent lights within the cloud. There were violets and oranges and pinks. And the scientist next to me said, *My God, we got an overyield*. The original [00:05:00] forecast was three to seven megatons. They finally arrived at the figure of fifteen megatons, and if you can imagine a train loaded with dynamite from Los Angeles [California] to St. Louis [Missouri], that's fifteen megatons of TNT [Trinitrotoluene].

While we were there, we had yet to experience the shock wave, and they made an announcement over the loudspeaker that the shock wave would be approaching and they were giving a countdown. It was arriving at the rate of about 1,000 feet a second; it would be a little over the speed of sound. And as we watched, you could see a depression in the water because of the pressure wave as it's actually approaching. And when it arrived at the ship we heard this loud explosion. I was wearing a baseball cap at that time, and the shock wave was strong enough that it lifted the hat off my head and it went over the fantail. I hope the fish are still enjoying it, what's left of it. But it was quite an experience.

The fleet continued to cruise. We were forty miles away from ground zero, if you can imagine, and we were cruising out there in an elliptical pattern more or less. And they had a message from Station 70 on Nan. We had left some people in there. It was all buttoned up. They had pressure doors on it and everything else. They were getting leakage into that station. And so they sent from the *Bairoko* helicopters in to pick them up. And when they landed, they radioed the guys, they jumped in their Jeeps, they drove to the helicopter pad, and then were flown back to the *Bairoko*. And of course everybody was glad to see them.

About a half-hour later, a RADSAFE [Radiological Safety] man was walking by the helicopters with a Geiger counter and his Geiger counter went berserk, and they realized that even the wheels touching down in the dust on the airstrip and flying back, the residual radiation was still high. It was shortly after that that we began to experience the initial fallout, and we were told to go below deck.

What was that like?

You didn't see it, but they said it was coming and they had radiation monitors on board the *Ainsworth*. So what they did is they had us all go below deck and they buttoned up the ship.

They had a sprinkler system on the deck and they turned the sprinkler system on to wash the fallout off all the structures out there. And we were buttoned down for twenty-four hours, and we cruised back to Enewetak.

At Enewetak we had a planning session. We got off. We stayed there for a couple of days and we had several planning sessions on what we were going to do. They wanted to continue with the tests because Bravo was the first shot. There was Morgenstern [Koon] which was in a cab on Tare and there were some barge shots still planned, so we had to go back.

We sailed back and anchored in the Bikini lagoon, and we brought a barge with us and the barge was anchored and tied to the *Ainsworth* and it was called a RADSAFE barge. It had a shower on it and you had radiation clothing and booties that you could put on. The task I was assigned was to take crews of camp workers who were not otherwise employed, go back to the various islands, and recover the personal gear because we could not live on those islands at that time. The radiation was so high.

So let me clarify here. There was personal gear left on the islands because you didn't expect [00:10:00] the radiation to be so high, and now you're going back to get that, is that what you're saying?

Yes. We actually expected to go back that night. We had food cooked and ready to feed everyone that was in the task force dinners that night at the various camps. That included the one on George, which is the Fox-George complex, the one on Tare, which was the main camp on Bikini, and the camp at Nan, as we called it. Everybody expected to be back and meals were prepared, but we never went back. In fact I think I mentioned the story before where when we went back to Tare, a couple of the foremen wanted to pull a joke on the superintendent, Crenshaw, and they found an old reefer [refrigerator] there with a bunch of rotted food in it and

they took some rolled roasts and put them up the legs of a pair of pants and some boots on the end of it and stuck it out the entrance to this RADSAFE. Then they went and got Crenshaw and brought him over in this area and he looks down and sees all these rolled roasts and boots and everything, and they yelled, *My God, we left someone on.* He almost died of a heart attack. But we laughed about it later, but it was a morbid-type joke.

But to get back to the recovery activity, what we did is every morning we would get up and I'd assemble my crew and we'd go down onto the barge, get all of our RADSAFE gear on, get onto an LCM [Landing Craft, M], and go the fifteen or twenty miles to an island and begin picking up stuff. We would stockpile it so we could bring in a ship and recover it and take it back to Tare.

What kind of stuff?

Generators, clothing. The thing we were primarily concerned with was people's personal gear. So everybody had a locker. We took banding equipment and sealed every locker and put an identification tag on it. Then we took it down to the LCM and the LCM transported it back to Tare or it went on to an LST and was ultimately shipped down there, and people were able to go back at Enewetak and see how it was working out and if they could find their gear. But we went to every island and recovered every bit of personal gear and as much recoverable equipment to support future tests as we could.

Now at that point, are you concerned about the radioactivity of that gear?

That was not considered. At that time, even though we wore film badges, they did not really concern themselves over the fallout on the material as you would today. Remember, this was in the pioneering era, 1954, and we still didn't know much about radiation. We just weren't much further than from the days of the queries.

But we did recover it and we'd go back that night and recount what we did, and I carried a log every day and [would] tell my management where we had been. Periodically I would go over to the *Curtiss* and meet with Sam Howell, my boss, and review what we'd done, and continue the progress and get ready for the next test, because the next test would be on Tare, so that would be no longer usable, and that was the Morgenstern shot.

Before you go there, let me ask you a question, and I'm sorry if I interrupted a thought. At that time, I know you're doing your own task and you've got to be focused on that, but do you [00:15:00] recall from your boss or from anyone else discussion of the fact that the test was so large and those kinds of things?

No. The extent of the overyield, once in a while it would be mentioned among the scientists, but our concern was, because Holmes and Narver was a support organization, about preparing for the next series. And under the next series I was in charge of the recovery crew because we had to service the generators just before test to make sure that they had sufficient fuel to carry them through the test period. And it was carried on from the *Bairoko* because it was the ship that had the helicopters on it and we had to ferry into the island on helicopters to refuel. And it was shortly after that that I was notified that I was going to have to leave Bikini because I'd already absorbed 4.8 milliroentgens [mR] when the limit was 3.9, excuse me, 3.9 roentgens [Rem] for a thirteen-week period and I had absorbed it in less than a month. And I'm suffering from that today. I have skin cancer I'm still getting removed.

But Morgenstern, when it fired, it was a fizzle. The primary is the only thing that was a yield, which was about twenty kilotons. And the next one was a barge shot off Fox and that was a success, and there were three more but I wasn't around for those latter three.

You bring up an interesting point, Ray, when you say with the fizzle that the primary, which is basically the fission explosion, was only twenty kilotons, which is about the size that the bombs in Japan were, and it reminds me of something you had said – I wonder if you could just go over that again – when we first spoke you said that compared to the tests you saw in Nevada, how really massive the Bravo test was.

It is really hard to relay all the feelings you get from one of those megaton tests. I told you about how the mushroom cloud developed, but what happened subsequent to that is the sky turned black, clouds developed all over, it was overcast. The shot went off. It was just before dawn and it was a bright day. But before the end of the day, the whole sky was clouded and it was high clouds. It was up maybe twenty-five, thirty thousand feet. The feeling of the magnitude, if you can imagine forty miles away and you can feel the heat when it arrives. It arrives at a separate time. It's a prickly heat. And then the pressure wave coming. The brightness. The feeling when they finally say, *You can take off your glasses now.* Those are memories that will stick with me for the rest of my life.

Now at Nevada Test Site [NTS] I saw some forty-seven tests up there. They were fired from balloons, tops of towers, and underground, and some on the surface. But they were small in comparison. We were ten or twelve miles from ground zero. In one case the shot didn't go very well there. It was a Los Alamos test. Hardly knocked down the balloon. And of course there was this rivalry between Lawrence [Livermore] Radiation [now National] Lab and Los Alamos. And so when Morgenstern out in the Pacific was pretty much of a fizzle, Lawrence Radiation [00:20:00] Lab scientists picked up and left and Los Alamos continued the test series there. On the other hand, in Nevada, when Los Alamos couldn't even hardly knock down a balloon, there was that rivalry [that] showed up again and there was that rubbing-in. And it substantiated

[Edward] Teller's contention that you needed competition to get the most effective tool. Without that, you had a limited exposure to ideas.

So I want to pick up the thread of when you leave the island, but I had one other question because your description of witnessing Bravo is so vivid, and I think it's a natural question that would come into a lot of people's minds, which is, what were your thoughts or your feelings at that moment vis `a vis what you had expected and what it was actually like?

Well, this was the first shot I had ever seen, and the only word I can think of is a short word, A-W-E, awe. You're essentially speechless. I'd come out of World War II and I'd seen bombardments with 105-millimeter cannons and all of that. I'd fired them. But they were nothing. They were peashooters compared to this. And when you realize, you go back and you look at the history of that shot and the *Fortunate Dragon*, the Japanese fishing ship, they were a hundred miles away and they got caught in the fallout and I think two of their sailors died from radiation. Others were infected by it. The island of Rongelap [Republic of the Marshall Islands], we sent a destroyer up there to take the Marshallese natives off Rongelap and removed them from there. I went back later during Hardtack [I] and the islands were still deserted. I think I told you that we found a pig there that had stayed and that was taken back to Washington [D.C.] where it was examined. But it had lived through that radiation. No one could have described that detonation to me and described it so that I would have comprehended the magnitude of it. It was awe-encompassing. There's pictures of people that on Enewetak 180 miles away that could see it. The sky lit up and everything else. They saw the tops of the mushroom cloud 180 miles away, in spite of the curvature of the Earth.

On a later program, on Hardtack [I], they were going to fly over a rocket off the island of Bikini. There was a miscalculation on how it would affect the people in Kwajalein, and they

cancelled that and moved all of the operations to Johnston Island and built two launch pads there. But there's still a missile complex on Bikini today.

How did they find that miscalculation?

Most things are checked and double-checked, but this had gone so far that we built all of the concrete structures, including the bunkhouse, so that the crew would be there, the launch tower, all the mechanical parts were there. I don't know who it was that ran the check, but thank God they ran the check because it would've been devastating to people who were trying to watch it on [00:25:00] Kwajalein, and of course that's a naval base down there and a major airfield. When you flew into Bikini or Enewetak, you flew into Kwajalein first. The pilots had to be specially cleared that flew the flights from Kwajalein to Enewetak. Then you flew from Enewetak to Bikini. I think I mentioned to you that when I had to leave, I flew out of Kwajalein with Hyman Rickover. He was sitting next to me on the plane flying out and I had the chance to spend about eight hours – it's a long flight – talking to him about the development of nuclear submarines. And of course being an engineer, I enjoyed it very much.

Which brings me to I think the one other question people have about this era. You're witnessing, as you eloquently described, this huge difference between what you had just been doing a few years ago in World War II in Italy, that's right? That's where you were?

Yes.

And then less than a decade later, in the Pacific, this huge shot, so much bigger even than the atomic bombs. Do you recall or was there talk or your own thoughts about the military application of these kinds of weapons?

Yes. I was obviously concerned but on the flip side of it was what the Russians were doing. They actually set one off that I understood was twenty-five megatons. All of us that were involved in

these tests, whether it was at Nevada Test Site or in the Pacific, the majority of us were veterans of World War II. We were doing a patriotic duty. I was proud to be part of it. The devastation of it and the results of it could have been horrendous, but you've got to realize, here we are in 2005 and there's never been another one fired in anger. And that's [what] war was all about or our war, from fighting the atomic death machine, if you want to call it that, was the standoff, the Russians and the Cold War. I was fortunate that I moved at a level that I was able to understand a lot of what was going on politically and managerial-wise, and it provided a lot more interest to it.

Explain a little bit more what you mean by that, "more interest."

I understood a lot of the logic. I was able to see the dispute going on between Livermore and Los Alamos. I was able to talk to the scientists, like Stirling Colgate who you've met, and their desire to develop the next device. It was we built this one; now we're going to build the next one. And the desire was to make the weapons smaller, the yield larger. And of course you had the fight going on between Teller and [J. Robert] Oppenheimer on whether the hydrogen bomb should ever have been developed or not. And as I told you earlier and we'll talk about it later, is I felt fortunate in being able to work with Dr. Teller directly, almost on a personal basis, even though I worked through their engineers. I think I told you a little bit about when I even left and we were talking about landing a warhead on the Moon to create a water source, and that was based on a direct call from Teller and myself when I worked for General Dynamics on the Atlas [00:30:00] program. It gave me that chance to see not only the politics but the political minds that went to work on that, whether it's Chuck Violet or Gerry Johnson or any of the other people involved in the tests.

And look at the basic applications. When you go to Plowshare, which is another session, but in Plowshare the thought was taking the phenomenology of nuclear detonations and making

peaceful use out of them. They even went to the Bible to come up with the name for it, picked it out of [the Book of] Isaiah. And I felt empowered by contributing to some of this research so that it could be used. Maybe it'll be used a hundred years from now. It's a dead program now but the concept may be used. The studies we made are still viable studies. It's containment and control of that explosive activity.

I'm forever grateful that I was able to operate at the level I operated on. One of the things at Bikini that we discussed earlier was that there was a caste system and that was still early on where as supervisors we had waiters and sat at a separate table and everything else. We had our own bar. It was every bit as it was in the military during World War II. It's not right but that's the way it was. But in those sessions, whether it was in your separate camp that you lived in or building that you were spending [time] in, you got to talk to the people that were the movers and the shakers. And I'm forever grateful for that opportunity. I would've liked to have been one of them.

I don't think you were too far away. Thank you for that explanation. That's very helpful. Let me think for a moment. It would be interesting to go back to Hardtack. I guess there are two things I want to mention and you have to tell me where they are in the chronology. There's Hardtack in the late fifties, and then am I correct in assuming at some time later that this incident occurs that you told me about on the couch before we started about the lawsuit [claim] about Bravo? What's the chronology of those two? We'll put them in order.

Well, under Hardtack I had been at Nevada Test Site for a year as resident engineer there, and I was assigned back to the home office in Los Angeles as chief project engineer, and that assignment, my responsibility was coordinating all activities with Lawrence Radiation Lab. The next series was the Hardtack I series in the Pacific and I went out there for that series, and when I

came back, as soon as I got back, was assigned to Plowshare as the project manager and program manager. Later, after I left Holmes and Narver and came back, I was the manager in Honolulu [Hawaii]; then I came back to Los Angeles, I went to Williams Brothers Engineering, which was a sister company, and I managed Elk Hill Naval Petroleum Reserve.

While I was there, I got a telephone call and a follow-up letter from Sam Howell who I mentioned earlier who was my boss in the Pacific. Sam said that the AEC [Atomic Energy Commission] had received a claim from one of the men that was under my supervision when we went in after the Bravo shot to recover equipment. The man was dying of cancer. I don't know [00:35:00] what type of cancer he had. His wife had filed a suit. He was in the last stages and she was trying to get some compensation, not only to pay for the medical bills but also to help her. In response to that, I wrote a defensive letter for the Atomic Energy Commission, telling them that to my knowledge, no one else had come down with cancer and that we took reasonable care with RADSAFE equipment and the showers when we got back. I regret that letter today because it's obvious from what I know about radiation now that that man died directly as a result of his exposure while he was under my supervision and I was unable to protect him. And that I have to live with.

Thank you for being willing to talk about that.

And that's one of the reasons when I mentioned Plowshare, because it became the flip side of it and it allowed me to look at the positive side of nuclear testing and the detonation and the devices themselves. So to a certain extent, I was able to offset some of the negative side of it.

I also regret what happened to the Micronesians, the Marshall Islands people, not only the Rongelapese but the Bikini, the Enewetakese, they had been removed and it changed their whole society. When I was general manager of the Honolulu office for Holmes and Narver, there was a

program developed on the resettlement of the Enewetak native[s] and most of the major conferences were held in my office there in Honolulu, and at that part I provided major support for the program. I flew down to Kwajalein one time and looked over the plans for the resettlement.

But one of the heartrending things was the meetings and conferences that were held at Fort DeRussy in Honolulu. The natives had several American advocates who were trying to put forth their case. One of the things that you realize when you hear their life story is that whether it's Bikini or Enewetak, those islands were their entire world. They did not know the outside world as we knew it. They didn't know English history and Spanish *conquistadores*. Once in a while, maybe a Captain Cook would sail through, but that was their exposure to the white man. They knew there were some other inhabitants of their race in the area and there was some communication back and forth, but Bikini as I recall had twenty-eight islands on it. Enewetak had a few more than that. Each family on those islands was sustained by reefside life and lagoon life and what was growing on their what they called *a watos* [sp?], which is a line drawn across [00:40:00] the atoll or the island of an atoll which bound one family's land from another; they were allowed to take from that land and without permission they couldn't take, as I understand it, could not take from the other's land.

So when we were planning in Honolulu on the resettlement of the Enewetakese, we had to respect that. We had to rebuild houses for them there. We had to allow for each family lagoon-side part of the land and the atoll side, ocean side, because a different type of sustenance was on both sides, as well as fresh water. So you had to play that game.

And my responsibility there was primarily to serve as a way station and to support the people coming out of Nevada, going on to Kwajalein, and subsequently the supervision of the

rebuilding of Enewetak. The one island on Enewetak where they had the original Mike shot had to be cemented over. They've got a cement cap on it today and it's to seal in the heavy radiation there. At Bikini where the Bravo shot went off, there is a crater that's 225 foot deep and a mile-and-a-half across. Just think, 225 foot deep, that's a twenty-two, twenty-three-story building you could put down the center of that and you wouldn't even see the top of it. Those are monstrous weapons and if you think of a weapon that size landing in a populated area, it isn't just the pressure wave and the things that you think about; it's the amount of radiation and fallout. It would contaminate for hundreds of miles around. It would make that area uninhabitable. It would make Chernobyl look like a firecracker. I don't like to lecture but that's the way I feel.

Please, lecture me. You have knowledge that I don't have so as much as you can tell me. A couple of questions about what you said about these meetings. Tell me a little bit more of the details of this. This was government people and advocates of the islanders and what would happen?

It was primarily advocates of the islanders, of the Enewetakese. They understood the cultural background. There was a lot of animosity towards the United States. If you can imagine, just look what's happening today in New Orleans [Louisiana], after hurricane Katrina. If you could imagine these people being displaced from 1945, '46 when the Bikini people were removed, and shortly after that the Enewetakese, until they were starting to be resettled in the mid-1970s, you're looking at generations that had never seen their homeland. All they could hear about was what their elders told them. One of the things, the Enewetakese lived on a single island but there were actually, as I understand it, two cultures, one at the Enewetak island, Japtan and that area; the other was at the more eastern side, up around Japtan. And so when they settled on the island

they lived [on], [00:45:00] they drew a line down the center of that island. One lived on one side and one lived on the other. It was a cultural thing.

We as a nation have a tendency not to respect people's culture, and some cultures are short-lived; others are long-lived. Whether you're talking about the Iraqis today, going back to the Persian cultures, or you're talking about the Romans, or you're talking about the Irish, or you're talking about the Indians here in America, we've got to respect their culture. As a nation, I don't think we've done this, in our trade policies, in our military policies, in our diplomatic policies. It's our way or none. There's a tendency to do that. I think there are a lot of people in the United States who believe in cultural rights, believe that people are made up of the history of their nation. You can't destroy that. But there are others who think you can go in and throw down a hammer and all the problems are solved.

Now you're getting me involved in the world of politics, and of course I was a Republican. I don't like politics to come in, but my philosophy and caring about people has changed dramatically since my experience in testing, and knowing what we've done to other cultures. It's heartrending. I still think of those fishermen out off Bikini, sailing around, trying to make a living, trying to get back home with the latest catch, and they bring back dying people because we haven't done our job. There were picket ships out there but we needed to do more than have picket ships out there. And granted that the overyield played a big part in it. If it had been contained in the area of three to five megaton, which is what they were talking about, a lot of that fallout wouldn't have happened, but it did. And under JTF-7 [Joint Task Force Seven], we were JTF-7.4, I think, which was the support element. Our job was to make sure everything ran smoothly, that people were fed, that structures were built, and we didn't have any decision-making and any of this other, but as I said earlier, I was interested because I rubbed shoulders

with those people that had that responsibility, and so that added to the enjoyment of it. But it was early in my career and I missed a lot of the points I should've been more attuned to.

Are there any other areas you'd like to cover this morning?

Well, I want to thank you for being so frank about what this all means to you. I have one other question and then we'll break, but it relates to what you were just saying and something you had said to me on the telephone, because you're really touching now on this question of responsibility and the fact that you were in support where responsibility lies. And when we spoke on the phone a couple of weeks ago, you said something to the effect of how the government itself had performed in taking care of the islanders. You had some view of that and I wonder—

Obviously I don't think they've done them right. We have completely changed their whole [00:50:00] culture. On Majuro which is the capital of the Marshall Islands, the natives are running around on mopeds now, they've turned into drunkards, they're living off the dole of the United States; if you just put yourself back in time to when they lived in an idyllic world, all they had to do is take their outriggers and go out in the lagoon or go on the shore – you see that picture in my office there of them throwing casting nets and bringing in the day's food – they were so little touched.

On Bikini Island, first time I went there, there were still remnants of the 1946 Able—Baker tests there, but also remnants of the civilization that was there. And one of the interesting things, because the islands are basically coral and have developed sand and stuff on the top of them, that they couldn't bury people much below the surface. Well, their impact from civilization was Coke bottles, and they would put the Coke bottles around the graves to build them up and put sand over the top of the buried bodies. The Japanese had been there. They had conducted military maneuvers prior to World War II at Bikini. There was an obelisk on the

island. It was dedicated to a Japanese pilot whose plane had gone down. And of course all of the hieroglyphics on it – not hieroglyphics but Japanese writing on it – told of this man’s life. Later when I was doing some survey work on one of the islands, we ran across a Japanese plane, a Betty that had crashed out there. The remnants of World War II were still there.

On Enewetak you could still see beached landing crafts from the assault on Enewetak when the American Marines landed. The results of the [Nickajack Trail], the cargo ship, a captain was trying to steer his ship into the deep-water passage into the lagoon there at Bikini and the port captain told him he didn’t have permission to come in, told him to turn around, and as he turned, he beached his ship on the reef of Japtan Island. And when I got there, even though it beached in probably 1944 or early ’45, it was still pretty much intact but it had broke in the middle and corrosion had occurred there and just before I left it broke in half. I guess parts of it are still out there deteriorating.

Now what was the name of that? I don’t think it was—

Nickajack Trail.

Nickajack Trail. Right. You told me about that before. OK.

But we’ve left our mark, or I should say scars, across the Pacific. Unfortunately they talk about the “ugly American” and there’s a lot of truth. I don’t know whether you’ve read the book *The Ugly American* but it’s worth reading on how other people perceive our civilization, if you call it a civilization.

And of course, you know I’ve told you previously, I built a missile base in Abilene, [00:55:00] Texas and we brought the missile squadron up to the ready because of the Cuban missile crisis, and I was proud of that. I’ve been in shipbuilding programs and I’ve run the largest oilfield in the United States, Elk Hills Naval Petroleum Reserve. And out of all of that, I

think there's been some good. There's some things I wish I hadn't been a part of, but you can't undo life and you have to deal with life's experiences that come along. So that's me and my memories.

OK. Ray, let's take a break now, and I want to thank you very much.

OK. I hope this will help your history of the test program.

It does in really significant ways and I really appreciate it.

OK. Thanks again, Mary. You've been a gracious host.

You're the gracious host. We'll take a break. We'll see where we are.

OK.

[00:56:15] End Track 2, Disc 1.

[End of interview]