ORAL HISTORY INTERVIEWS

LESTER LLOYD

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STATUS OF INTERVIEWS:
OPEN FOR RESEARCH

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Interviews Conducted and Edited by:
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Senior Historian
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Statement of Donation

STATEMENT OF DONATION
OF ORAL HISTORY INTERVIEWS OF
LESTER W. (BILL) LLOYD

1. In accordance with the provisions of Chapter 21 of Title 44, United States Code, and subject to the terms, conditions, and restrictions set forth in this instrument, I, Lester W. (Bill) Lloyd, (hereinafter referred to as "the Donor"), of Boise, Idaho, do hereby give, donate, and convey to the National Archives and Records Administration (hereinafter referred to as "the National Archives), acting for and on behalf of the United States of America, all of my rights and title to, and interest in the information and responses (hereinafter referred to as "the Donated Materials") provided during the interviews conducted on December 6, 1994, and March 23, 1995, at the regional offices of the Bureau of Reclamation in Boise, Idaho, and prepared for deposit with the National Archives and Records Administration in the following format: cassette tapes and transcripts. This donation includes, but is not limited to, all copyright interests I now possess in the Donated Materials.

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Lester W. (Bill) Lloyd

INTERVIEWER:
Brit Allan Storey

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Editorial Conventions

A note on editorial conventions. In the text of these interviews, information in parentheses, ( ), is actually on the tape. Information in brackets, [ ], has been added to the tape either by the editor to clarify meaning or at the request of the interviewee in order to correct, enlarge, or clarify the interview as it was originally spoken. Words have sometimes been struck out by editor or interviewee in order to clarify meaning or eliminate repetition. In the case of strikeouts, that material has been printed at 50% density to aid in reading the interviews but assuring that the struckout material is readable.

The transcriber and editor also have removed some extraneous words such as false starts and repetitions without indicating their removal. The meaning of the interview has not been changed by this editing.

While we attempt to conform to most standard academic rules of usage (see *The Chicago Manual of Style*), we do not conform to those standards in this interview for individual's titles which then would only be capitalized in the text when they are specifically used as a title connected to a name, e.g., "Secretary of the Interior Gale Norton" as opposed to "Gale Norton, the secretary of the interior;" or "Commissioner John Keys" as opposed to "the commissioner, who was John Keys at the time." The convention in the Federal government is to capitalize titles always. Likewise formal titles of acts and offices are capitalized but abbreviated usages are not, e.g., Division of Planning as opposed to "planning;" the Reclamation Projects Authorization and Adjustment Act of 1992, as opposed to "the 1992 act."

The convention with acronyms is that if they are pronounced as a word then they are treated as if they are a word. If they are spelled out by the speaker then they have a hyphen between each letter. An example is the Agency

for International Development's acronym: said as a word, it appears as AID but spelled out it appears as A-I-D; another example is the acronym for State Historic Preservation Officer: SHPO when said as a word, but S-H-P-O when spelled out.

Introduction

In 1988, Reclamation began to create a history program. While headquartered in Denver, the history program was developed as a bureau-wide program.

One component of Reclamation's history program is its oral history activity. The primary objectives of Reclamation's oral history activities are: preservation of historical data not normally available through Reclamation records (supplementing already available data on the whole range of Reclamation's history); making the preserved data available to researchers inside and outside Reclamation.

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For additional information about Reclamation's history program see:
www.usbr.gov/history

Oral History Interviews
Lester Lloyd

Storey: This is Brit Allan Storey, senior historian of the Bureau of Reclamation, interviewing former Regional Director Lester W. Lloyd, commonly known as Bill Lloyd, in the regional offices of the Bureau of Reclamation in Boise, Idaho, on December 6, 1994, at about 1:30 in the afternoon. This is tape one.

Mr. Lloyd, if you could tell me, please, where you were born and raised and educated and how you eventually ended up at the Bureau of Reclamation.

Early Life

Lloyd: Well, I'd be glad to. I was born and raised in the Connecticut Valley in the vicinity of Hartford, Connecticut. After living on the farm until about age seventeen, I then went in the Navy and got some electronic experience, and then went on to college at Worcester Polytechnic and received my degree in electrical engineering, and after that time worked in the Northeast for several different manufacturers of electric and electronic products. Then started thinking about the defense electronics business and how it seemed to be a re-do and a go-go proposition that didn't seem to have much appeal for me at that particular time.

So I looked at the Bureau [of Reclamation] Design Office in Denver and signed on in 1961 after–well, I didn't mention I graduated in 1952. So nine years afterwards, I signed on with the Bureau. At that time with the Bureau, Design [Office] was going at full clip, all types of design for the Colorado River Storage Project[1] and

1. Authorized in April 1956, the Colorado River Storage Project "provides for the comprehensive development of the Upper Colorado River Basin. The project furnishes the long-time storage needed to permit the States of the upper basin to meet their flow obligations ... as defined in the Colorado River Compact, and still utilize their apportioned water. See "Colorado River Storage Project," in US Department of the Interior, Water and Power Resources Service, *Project Data* (Denver: United States Government Printing Office, (continued...)

others. I really found it very satisfying. We had overtime, if you could imagine. The Bureau was going full clip at that time in the design work.

One of the great benefits, I guess, for working the that Design Office was that I was able to become professionally involved in the electrical engineers and went to national meetings on the application and design of the apparatus that we were applying throughout the Bureau power systems.

Going to Work in the Regions

Then about 1970, the opportunity came up to get an Assistant Director of Regional Power in the Billings Office. I took that and moved the family to Billings, Montana, where we stayed for ten years.

Eventually, after Bill Graham moved to Washington as Chief of Power, I became the Regional Supervisor of Power. At that time, Harold Aldrich[2] was Regional Director, and soon after that, Bob McPhail[3] moved in after Harold retired. Then, let's see, I'm trying think whether Bob–Bob moved to the Western Area Power Administration (WAPA) when that split took place. Bob picked up and moved to Denver, and the Western Area Power Administration was formed, and I became Regional Director in Billings.

After about two years of that, moved to Boise in the same position. That was at the time

1. (...continued)
1981), 355-372.
2. Harold Aldrich served as Regional Director of Reclamation's Region 6, Upper Missouri Region, from1964 to 1973. Mr. Aldrich also participated in Reclamation's oral history program. See Harold Aldrich, *Oral History Interview*, Transcript of tape-recorded Bureau of Reclamation Oral History Interview, conducted by Brit Allan Storey, senior historian, Bureau of Reclamation, March 7, 1995, in Billings, Montana, edited by Brit Allan Storey, www.usbr.gov/history/oralhist.html.
3. Bob McPhail served as Regional Director of Reclamation's Region 6, Upper Missouri Region, from 1973 to 1978, before becoming director of the Western Area Power Administration in 1978.

Keith Higginson was Commissioner.[4] I felt, in Billings, that the Garrison Diversion Project,[5] which I spent lots of time on, with an International Joint Commission, that's when I was an Assistant Regional Director, was not very promising for the water business. I had decided not to go with the power business with Bob McPhail, because somehow by that time I guess I was convinced that the Bureau was the outfit to be with. I mean, it wasn't that I wasn't interested in the power field, but, frankly, there was the opportunity to stay on with the Bureau. So here's an incident where, I guess, an electrical engineer stayed on in the water business. I had to learn a great deal about the water business, and probably still am. But it was an opportunity that I'm glad I took. Moving on to Boise here, there was just plenty of water business. The importance of irrigation is strong, I think, in all the Bureau's old regions, but it is especially strong here in the Northwest.

I found that there was a good acceptance of a person that came from Montana. It was interesting that the water users wondered who this guy is that came in from Billings. I mean, is he really genuine or not? They would look and talk to you and say, "I guess he's all right. He's from Montana. He's no threat." What they were worried about is people moving in from California, with the Bureau, internally, that their loyalty somehow had been tainted such that their water would get removed. People in Idaho are

4. R. Keith Higginson was Commissioner of the Bureau of Reclamation under the Carter administration from 1977 to 1981. Mr. Higginson also participated in Reclamation's oral history program. See R. Keith Higginson, *Oral History Interviews*, Transcript of tape-recorded Bureau of Reclamation Oral History Interview conducted by Brit Allan Storey, senior historian, Bureau of Reclamation, March 22, 1995, and April 19, 1995 in Boise, Idaho, edited by Brit Allan Storey, www.usbr.gov/history/oralhist.html.

5. Initially authorized for construction in August 1965, the Garrison Diversion Project was to "divert water from Lake Sakakawea, formed by Garrison Dam on the Missouri River. The water would be used for irrigation of about one million acres in east-central North Dakota, municipal and industrial use in several towns and cities, fish and wildlife, and recreation in Devils Lake and other impoundments. Flood control and pollution abatement are other purposes." For more information, see "Pick-Sloan Missouri Basin Program Garrison Diversion Unit," *Project Data*, 869-876.

very strong about keeping their water for themselves. I mean, they have to let it go down the river–that they don't evaporate or otherwise consume. I got a kick out of that and got along well with the water users.

We had no big projects to bring the water users, I guess. I lament that a little bit. But on the other hand, Idaho was pretty well developed by the time I got here. Teton Dam,[6] of course, was a failure that caused a lot of consternation on the part of our friends, as well as the insiders, but that was slowly quieting down, with the exception of one irrigation district, the would-be beneficiaries. They wanted it back in the worst way, and still do today. Teton Dam is still something in their future. But that wouldn't be so much to expand acreage, it would be to ensure a better water supply for existing acres.

Balancing Multiple Issues with the Region

Some of the biggest activity, strongest activity, other than just general management, keeping things together and keeping contact with the congressional delegation and our constituents, was the matter of–and still active today. And that is offset to the salmon impacts and the anadromous fish impacts, especially in the Yakima Valley and now throughout the Northwest. That's one that the Bureau is smack in the middle of.

It's pretty heart-rendering to try to figure how you can do all the things right today, having made the commitment back then to provide water for agriculture and divert it and set the family farms up, and then come along and say, "Well, that water has got to be removed. It's got to be left in the river for the fish." I guess

6. Teton Dam was planned as the major feature of the Teton Basin Project in eastern Idaho. On June 5, 1976, shortly after construction was completed, the dam suffered a catastrophic failure, causing over billion dollars worth of property damage and 11 casualties. For more information, see Andrew H. Gahan and William D. Rowley, *The Bureau of Reclamation: From Developing to Managing Water, 1945-2000*, Volume 2 (Denver: Bureau of Reclamation, United States Department of the Interior, 2012), 820-832.

we're close to some resolution to the decision that the citizens of the Northwest are going to have to make in how much more they are going to give to the fish in the way of in-river flows, at the detriment of navigation and power generation and agriculture, agriculture being our prime concern, certainly in Idaho.

Missouri River Basin was Largely Power

So Idaho is much broader in its irrigation contact than was the Missouri [River] Basin. The Missouri Basin was largely power. That was the strong driving force. It is interesting from my perspective. I came on as a technical person and served in that capacity for ten years as designer. That was gratifying for professional reasons, involved in with the electrical engineers and the western area power systems people to try to avert blackouts after 1965. That was a big subject for some of us designers is how to keep this western area system from busting up again as it did back–well, several times, independent of the '65 blackout in the East, which really fired off all this reliability concern.

But aside from the power interest, the agricultural aspects became very interesting to me once you got to know the people and work with them stronger. After all, they were constituents. You get caught up in trying to serve them and help. I guess after you retire, you stop and look back and you say, "Well, gee, how much help do they need? They know everything we know, practically, or they can buy the help today on a when-and-if-needed basis from consulting firms." They say, "Well, the Bureau used to hold our hand and do it for free, and now they're going to charge us. We're going to go look elsewhere." And that's what happened a lot of times with our loan programs, and, of course, that's what it was designed for. The loan program was to provide access for the consulting community to provide designs and construction for qualified applicants. But I now look back at it and say that they're pretty well grown up, these irrigators. They know what to do. They certainly have politically for years, and

I think now, technically, they do a good job.

Important to Keep the Federal System Together

I think probably the federal system needs to be kept together for certain key crucial operating reasons for flood control–maybe fisheries. But on the other hand, there's a lot that could be taken over by the water users if the politics were right, and they were willing to take it on and do a responsible job, and be responsible to, well, say the state, for example. We tried that. We sent out an inquiry at one time about their willingness to take on the systems, and there wasn't very much. They would take, for instance, Grand Coulee [Dam], but they didn't want to pay anything for it, and they wanted the proceeds from it, of course. Grand Coulee is a great cash register. It generates prodigious amounts of power at low cost, low operating cost. They'd love that one, but they didn't want to be involved in dam safety, for example. That's costly. It gave you a little feeling that, well, they knew where the benefits were, and as long as the system was there. I guess that came later in my career. I began to realize that, well, it wasn't all striving and destitute people who needed lights on the farm and a stable farm situation. It changed from that to one of, "Well, we're a little stronger than you'd first assume."

I know that's the case in California, for example. That's the way it looks from Idaho, at least. The whole economic base is stronger where the growing climate is longer and the crop values are higher. I mean, we went from a $400-an-acre crop value in the country that I'm used to or served in, was high. Four hundred dollars an acre in California, it's up into the $2,000, $3,000, $4,000 an acre, ten times the crop value per acre. It means they have more strength politically and dollars, lobby-wise and otherwise. And that is one of the reasons I guess the Idahoans worry a little bit about Californians; its strength and influencing where the water goes.

So for a state water engineer in Idaho, that's his first test is to make damn sure it doesn't go

elsewhere. We keep it in state. I'm sure that the current staff of the Bureau has told you about the beating they take for letting the water go, letting the water go from storage when it could be held back for dry-year use on farm. Even though it's not committed presently, it could under contingency, or under special circumstances, go to in-state use. To release it for salmon must be tough on the current administrators. But then the environmental values are changing.

Storey: Let's go back and talk about the Connecticut Valley. You were raised on a farm?

Farm in Connecticut

Lloyd: Yes, dairy and tobacco farm, and lived on it until 1941, so it was only about eleven years.

Storey: Did you actually do farm chores?

Lloyd: Yes. I didn't have to milk the cows, but I did have to participate in the tobacco harvest. Field tobacco is a very labor-intensive thing. So we all pitched in on that and picked the leaves and did the hoeing and all that routine.

Storey: I understand a lot of people have reactions to the tobacco when they are harvesting it.

Lloyd: That's interesting. I didn't appreciate that. I know we would get all gummed up from the juices, but nobody ever got relieved. I'm not talking about my family particularly, but of all the associations I had and all the neighbors who were growing it, I never recall anyone that got relieved. That particular type of tobacco, perhaps, or the way they did it.

Storey: But it's a messy job?

Lloyd: Oh, it's a messy job.

Storey: Is it a hard job?

Lloyd: Hard job. Lots of stooping and just no end to menial tasks. It made for a very high cash crop

for many families. I guess they are still doing it, probably not as much as then. But I know there were some first-generation European, Polish families, would have six or seven children who were all working, and they did quite well. They were able to go on to school and college. It was the last time they all had to stay on the farm, but some stayed back.

Storey: Did you all cure the tobacco on your farm?

Lloyd: We cured it to the point where it could be bundled and then sent for subsequent curing and processing and hand processing.

Storey: What did that involve? Do you remember?

Lloyd: The curing itself?

Storey: Well, what you did on the farm.

Lloyd: What we did on the farm is to pick off the full stalk. You didn't pick leaf at a time in the species or the variety that we had. You'd spear it on to a lath, a four-foot lath, about five plants, and then carry it by wagon to a barn where it was jacked up as high as five stories, five low stories, into the top of the barn. It would stay there until the winter, when on a damp night you could handle it, bring it down, take it off the stalk, and put it in a bundle, and tie the whole works up and send it off to the buyer. That was the last you saw it. You sold it in a bundle, maybe a fifty-pound bundle, for cigar tobacco.

Storey: This is not the wrapping leaf?

Lloyd: The wrapper is just a little bit different. The wrapper was also grown in the valley. We didn't happen to grow that one.

Storey: Did your family do any irrigation on the farm?

Lloyd: No, back in that forty-inch-plus per year [of rain], we didn't have to that. We'd pray for no hail. Hail was the great demolisher of wrapper, binder, any cigar tobacco. Today they shred it, put it back together as paper. That's what they

do for cigars, as I understand it. But at that time, a good whole un-punctured leaf was what was expected. Anything less than that, you would take a loss, deduct.

Storey: When you sold the crop.

Lloyd: When you sold the crop. Right.

Storey: Did you have a tobacco barn where you could open slats in the sides to get air circulation and so on?

Lloyd: Yes, we had three or four barns devoted to that.

Storey: How many acres are we talking about here?

Lloyd: Oh, there was only about twelve acres. Small acreage.

Storey: That was in tobacco?

Lloyd: In tobacco.

Storey: Yet you required that many barns?

Lloyd: Yes.

Storey: So it requires a lot of storage space?

Lloyd: There's the whole plant, and they were spaced. As I recall, the chief, or whoever, gave the person that was racking them a stick and said, "This is the spacing we want." It may have been six or eight inches between the laths as you were laying them on successively.

Storey: Evidently the barn was full of racks of some kind that would take the laths?

Lloyd: Yes. There were loose four-by-four holes that you adjusted to fit. It was a hazardous business. It was worse than a sailing vessel. People were falling generally every year from that, but a good one wouldn't. You'd pass the loaded lath. This has five plants on it and probably weighed sixty pounds. Passed that hand-to-hand up through as many as five stories. And then the man that

placed it, the person that placed it, would space it from the previous one and fill the barn.

Storey: So it would be spaced between the laths, and it would also be spaced between the plants on the lath?

Lloyd: Yes. So lots of air circulation, and I guess that's why the high volume. Big barn, but not much of a load.

Storey: Did you ever participate in manipulating the doors on the barn, the air circulation doors or whatever they are?

Lloyd: I don't think so. I guess maybe we went and closed them or opened them at that critical time in the fall when you were trying to get the tobacco at the right dampness. As I recall, too, it was weighed, of course, and the right dampness was important for your pay and the handling, both. So we went to move it.

Storey: To move it.

Lloyd: To move it and get the weight out to where you–to dry. That's right, it would crumble. You couldn't handle it.

Storey: Did you ever participate in going to auctions or anything where the tobacco was sold?

Lloyd: No, it wasn't sold at auction. That's an interesting marketing question. I never even thought about, Southern tobacco being sold at auction. We sold directly to a buyer who set the price. General Cigar, let's say, for example, would say, "This is what we're paying." You could hold off, not sell, but you didn't go to auction with it. Didn't lay it on open.

Storey: I went to school in Kentucky, so I saw the blue-grass tobacco auctions and so on.

Lloyd: Those were good days, and my dad decided that, well, gee, farming has lots of work and not much reward, so he got into the insurance business and had a change of direction. I stayed and

continued to work, even though I lived in the same town. I just continued to work on farms for other people. That's back when fifty cents an hour was just great. That was in the forties, as I remember.

Storey: I forgot to ask you when you were born.

Lloyd: 1928.

Storey: '28?

Lloyd: 1928.

Storey: Okay. So when did you graduate from high school?

Educational Experience

Lloyd: '52. Oh, high school. '46, and then I went in the Navy for two years. I was in college to '52.

Storey: What was your high school education like?

Lloyd: Oh, I guess I wasn't all that enamored of the academic aspect of it. I know they sent me off to school for the last two years of high school. I wasn't getting enough out of it. They were afraid I wouldn't get in college, so I got shipped off to boarding school for two years. There I was instilled with a little more purpose of study, and that seemed to work. From there I went into the Navy electronics program, directly, which was very intense academically, in a particular area. I found that was really interesting, and that was good stuff. I like that sort of thing.

Storey: I'm missing something. You said 192-

Lloyd: Eight.

Storey: 1928, you were born. And you graduated high school in '46. Oh, that's eighteen, isn't it. I'm sorry, I was making 28, and I was trying to figure out what's wrong here?

When did you go into the Navy?

Lloyd: 1946, right after high school.

Storey: Right after high school. You enlisted?

Lloyd: Yes.

Storey: And that was a two-year hitch?

Naval Experience

Lloyd: Two-year hitch. They cut two months off of it, too, they were so anxious to get rid of us. They had sent us to school for the whole–it was a wonderful opportunity.

Storey: Did you get to choose to go to an electronic school?

Lloyd: Yes. You got to choose to go in, provided you met the paper requirements, and you stayed as long as you were successful. And you could get–I think every two weeks they evaluated you, and you could stay if you did okay. If you didn't, out you went to sea duty of whatever they had left. So that was a good incentive for a lot of us to keep studying.

Storey: What caused you to choose electronics?

Lloyd: Oh, I think that must have been the word around. One, I liked that sort of thing. I always tinkered with telephone equipment that one of my relatives would give me. He worked for the telephone company. I'd hook up telephones and do anything I could myself, electrically. So that was just an interest. This opportunity came along, and it was the G-I Bill associated with completion of service and all that. So it looked like a good deal. I think a neighbor had located it, also. He was a neighbor and a friend. So we went both went to Great Lakes in 1946.

Storey: So the G-I Bill played into your decision to join the Navy?

Lloyd: I think it did. I think my father's guidance must have. I can't remember specifically, but I think it did.

Storey: And why did you choose the Navy?

Lloyd: I thought the Navy would have a good school, and, I don't know, it was the Navy. That just seemed to be the way. I don't know if we had any seafaring, being from New England, Rhode Island, my mother's from Rhode Island, that's kind of a nautical state. Yes, I remember four or five years before that, being in Newport and seeing all the ships and the Navy people and thought that was pretty great. So perhaps that was part of the carryover.

But they did, they had a specific electronic program, and they did a lot of selling and telling you what you'd get, not only in the way of rating and pay, but when you got this is what you had, as I recall it now. And they were just trying hard to staff the Navy. Then everyone is running for good jobs back home, and they were with all this equipment and the fleet with no one to run it. They thought they were going to be in short supply, so they were out recruiting.

Storey: This was one year after the end of the war [World War II].

Lloyd: Yeah. We weren't sure where things were going.

Storey: And we hadn't quite gotten to the Cold War yet.

Lloyd: That's right. We hadn't gotten to the Korean War yet. I just slipped through that.

Storey: What did they teach you in electronics school in the Navy?

Naval Training

Lloyd: Well, very little in personnel management. Very little about Navy history. They really spent about 99 percent of the time on the technical aspects, all the way from the basic mathematics, I'd say, algebra on up, through–that was about it. They didn't go to far into the mathematics, but they went into the gear in great deal About half your time, after you got through the primary

work, the secondary work was spent on specific equipment, how it worked, what you had to do to maintain it, put it in topnotch condition. So they were looking for people to run the fleets.

Storey: So it's basically sort of practical maintenance-type education?

Lloyd: Oh, yes. Yes.

Storey: No theoretical stuff.

Lloyd: They had to give you enough theory so you understood what you were doing other than just plugging in boxes. Recall in those days, here is the equipment and every piece was engineered and put in place. You couldn't pull out a module and stick in a new one. You had to know wire-routing. You had to know Ohm's Law, hopefully, and all the elements necessary so you could figure out what to replace in this "dirty dog." And they would go make defects in the equipment and test you on it. That was all part of your weekly routine.

Storey: To see whether–

Lloyd: To see whether you could find it, if you could figure it out. Sure. And a lot of it is intuitive, and, as you said, you don't need to even know algebra. But they went through that. It was a good program, for that reason. You had some basic understanding of electricity and why it does what it does. And with that, they quickly got on to the practical aspect, which is what they were most concerned with.

Storey: And you said you went to Great Lakes. That's a station, isn't it?

Lloyd: Naval Training Center, at that time.

Storey: Great Lakes Naval Training Center. Where was that located?

Lloyd: North Chicago. North Chicago. It's halfway between Chicago and Milwaukee. Up the shore. It's a beautiful location, except the wintertime

when it blows hard. But it was a good routine. And then went to Anacostia, to Washington D.C.

Storey: To the naval shipyard?

Lloyd: Naval Research, Naval Research. They had a school there that got into the details of the equipment. That's the secondary school. And so it was all over in a blink–twenty-two months. But I only served a short while, and that was in Newport, of all places. I never got to sea. I wasn't in long enough. I had to sign on for more time if you wanted to go to sea. I was anxious to get to college and continue on with my learning, and did that.

Storey: So you were basically in school for the full time you were in the Navy?

Lloyd: Basically, all but about four months, four or five months. But it was a good program, from my standpoint. I must say the Navy–I did give them some service, all right. I worked for four months, and there was a variety of things to be done there in Newport and the vicinity. I don't know what they do today. I'm sure they sign up people for years in order to go through that much schooling.

Storey: Now when we said Newport, we're talking Virginia rather than Rhode Island.

Lloyd: I'm talking about Rhode Island. I'm sorry, I'm talking about Newport, Rhode Island.

Storey: You are? Oh, okay.

Lloyd: Yeah, "the" Newport has got even more business than Rhode Island.

Storey: And what was there in Newport, Rhode Island, that caused you to be stationed there?

Stationed in Newport, Rhode Island

Lloyd: Well, there's a torpedo station there, and there was also Quonset Point, which is across the bay,

Quonset Point Naval Air Station, and I was there for a good deal of that time, also. Both Newport and Quonset Point, which is the old air station.

Storey: So were you working on airplanes?

Lloyd: No, the land-based equipment.

Storey: Such as?

Lloyd: Oh, the radio transmitters and teletypes and all the equipment that they have to keep in touch with the outside world of the Navy.

Storey: So it was basically communications.

Lloyd: Yeah.

Storey: Electronics, in your case. And there would be other specialists. Did they rate you, give you titles or something that way?

Lloyd: No, if you were an electronic maintenance man, or an electronics technician is what they were called, you were all given the same rating. With one exception–if you were air, you had a different schooling. Your secondary schooling, instead of going to Washington and Anacostia, you'd go to, say, Corpus Christi. Then you would be versed in the equipment that the flying service used. So it was different. So you would have a different rating. That was the only distinction, as I recall, electronics general or electronics aviation.

Storey: But the Navy wasn't a career opportunity, from your perspective?

Lloyd: Yeah. I don't know why. It looked good. Some choices you make are fortuitous, though I guess getting on to college was important. And what I wanted to say is probably the success at the naval school and the discipline was good in getting into college. It made a difference, I'm certain. I mean, my high school record was not all that great to get into one of the better engineering schools in the Northeast. Wouldn't

have done it by itself if I had just gone from school. But having gone through this course, it was recognized enough to say, "All right, we'll give you a shot at it." And then college worked out pretty well, too. I mean, it was something I liked, and I was motivated.

I found probably I began to bog down in some of the humanities like economics. That didn't seem, for some reason, to be as tied to my–

END SIDE 1, TAPE 1. DECEMBER 6, 1994.
BEGIN SIDE 2, TAPE 1. DECEMBER 6, 1994.

Story: You were saying, I believe, that–

College Experience

Lloyd: I was talking about the importance of the Navy training in my acceptance in college. It made a big difference, I think. My high school record was not all that outstanding. It probably would not have been enough to make into Worcester Tech, but with the success at naval school, that did it. Then I was saying that of the courses that I had at Worcester, the engineering courses were great. I was doing fine in those. Some of the humanities and economics weren't as great, and I'm sorry for that. I should have spent more time on them. But you do things you like, sometimes, if you're not well disciplined. At least that's what I did. But anyway, college was a success and then went to work for General Electric for several years, I guess, in total, probably four or five years.

Storey: Where is Worcester Polytechnic?

Lloyd: Worcester, Mass. Right in the middle of the state.

Storey: W-O-O-S-T-E-R?

Lloyd: W-O-R-C-E-S-T-E-R.

Storey: Ah, okay.

Lloyd: Different than the Ohio.

Storey: There's a Wooster somewhere in New England, also, a Wooster College there, also, but I don't know exactly. My wife taught at Wooster in Ohio, and that's how I just happen to know that.

Were there any professors there that particularly influenced you?

Lloyd: There are always standout professors, I think, that influence you and your enthusiasm for courses, and you admire either their practicality, their ability to teach, just their humanity. Yes, I would say so. I don't think any of them were mentors or people that suggested, "This is where you should go," but you pick up human traits and remember those and try to emulate them, I guess, as you go through life.

I recall one professor who was really almost a father to the Electrical Engineering Department, Professor Newell, who did a little consulting work for one of the labs nearby. Instead of using a fancy electronic measuring system, which he could have easily done, he just ended up with some pegs and some wood to measure some deflection. That really impressed me, that he didn't have to go snow them over at the hydraulics laboratory with his knowledge of electronics to do the job for them very practically. So that's one example of practical engineering that was, I hope, significant somewhere in my life.

Storey: Do you remember his name?

Lloyd: Yes, Newell, Professor Newell.

Storey: N-E-W-E-L-L?

Lloyd: Yes. He was one. Professor McCollough was a strength and materials, I guess, giant at that time. He had written a text with Timoshenko,[7]

7. Stephen P. "Timoshenko (1878-1972) is often referred to as the father of applied mechanics in the United States. He wrote seminal works in the areas of engineering mechanics, elasticity and (continued...)

another strength and materials strongman, and he was an excellent teacher. He was a person who made the class come to order in a positive way, a learning way. He had gift for a subject that wasn't all that exciting, from many standpoint, of being able to get it across. I remember other professors who were knowledgeable, capable, and bright people, but just had the reverse; they put you to sleep. Maybe it was the timing. I'm talking now about teenager type that I was, you just had trouble sticking with some of them because of their presentation.

I remember another young professor whose name was Bill Grogan. He had just gotten out of the service. He was back at college. He ended up being head of the department and much more at the college, again because of his teaching and administrative skills. I don't think he was a research specialist or somebody of that sort, but just a good all-around educator. I had him for some of the beginning courses, that's all he was able to teach at that time. He went on from there. You could sense you had a good one here, and people liked him for what he could do.

Storey: Did you apply to go for an electrical engineering degree?

Selecting Electrical Engineering

Lloyd: Yes. You declare after sophomore year–no, after freshman year you declared, and then you become part of that department. You follow their prescription with a few electives. In order to get a degree, you could go two ways, electronics or power. I chose to go with electronics because of my naval interests, I guess, and other sources.

7. (...continued)
the strength of materials, some of which are still in regular use. His accomplishments in the field of applied mechanics and his influence in engineering education are still felt today." See Stanford University Library, "Stephen P. Timoshenko Collection," https://library.stanford.edu/collections/stephen-p-timoshenko-collection, (Accessed December 2016).

Storey: You didn't consider any other kind of engineering?

Lloyd: Not a whit. I don't know why. I guess it just occurred to me that I was destined. It wasn't that I went to school searching for something to do. I knew what I was going to be, I guess. Now that you mention it, I've never been asked before that way, but I know what you're saying. There are a lot of people who go to school that aren't sure. Oh, I had misgivings at times. I said, "This is too darn hard. I don't want to do any more of this stuff. God, this is not working out." But really it was, and it was what I wanted to do. That's why I stuck with it and headed that way. So there wasn't any misgivings at that time.

I guess when I got out, I kicked around at various jobs in the private sector and got away from the solely engineering and design aspects and got more into manufacturing. You get soon away from your trade. If you don't do it for two or three years, you're off the main line. I'm right now going back into electronics a little bit for designing and building some of these exhibits, and I just marvel at what's happened in the last forty years. They haven't stayed still by any means. In fact, they've made wonderful advances that makes the job of building things simpler. Understanding them–they take a lot of the need for understanding all these various components out because they build little modules of things that you can plug together, if you follow what I am saying. That's the microchip business today.

Storey: Worcester. What is its current name? Do you know?

Lloyd: Worcester Polytech?

Storey: Yeah.

Lloyd: Still the same.

Storey: It's still the same name?

Lloyd: Worcester Polytechnic Institute.

Storey: Then you went to General Electric, your first job out of college.

Working for General Electric

Lloyd: Right. I went on their test program, what they call the test program. It was testing apparatus equipment and seeing where the, I guess, the engineer should end up, or trying to make a match. For the first year, you rotate around every four months, three months, and go to a different location, and then settle down in one of those that you were at.

Storey: I'm sorry. I'm not following what you were doing.

Lloyd: Okay. I was serving as a test, what they called a test engineer, on the testing of the equipment as it was completed. In other words, it wasn't just an inspection. It was testing. It was firing.

Storey: At the manufacturing plant?

Lloyd: At the manufacturing plant. Oh, yes, I'm sorry. All of these, I worked in–well, in one of them I worked in the sales office. That was just servicing the sales needs of the customers in the New Haven office of General Electric. We were servicing and just getting to know that part. Another one was testing machine gun turrets, live-firing machine gun turrets, which was a night duty in Vermont. Then I tested X-ray apparatus in Milwaukee. Then heavy motors in Syracuse. Then finally settled down into quality control in clock and timer manufacturer in Massachusetts, back to Massachusetts, and stuck with that for quite a while. Then went to work with a small electronics manufacturer in the quality control. And lo and behold, General Electric was the prime contractor. I went back with General Electric from that small employer, this time into Syracuse, New York. But that was in a design capacity at that time.

Storey: What was the name of this small company?

Lloyd: Harris Transducer.

Storey: Harris Transducer?

Lloyd: Harris Transducer. This is for the Navy, for the sonar equipment. Wilbur Harris was a physicist, a bright guy that had a product, or he thought he did, and we tried to help him. We had some rocky times but finally got a product going but was bought by General Electric.

Storey: So you were supplying to General Electric, who was then prime contractor.

Lloyd: They were the prime contractor. Right.

Storey: To the Navy?

Lloyd: Uh-huh.

Storey: Okay. You mentioned something a few moments ago about matching the equipment to the customer, I think.

Matching Equipment to the Customer

Lloyd: Trying, yes. Well, this was at the very lowest level of sales activity. People would call in and they would want to know about what apparatus was available, and so forth. Or send them a flier, you know. We did have all sorts of catalog information. We'd send them that and try to help the sales people and keep the sales, the professionals, fully appraised of what we did, I did. Then I'd go out with the apparatus engineer, whose job it was to make sure things were operating properly in the field. If a customer had a problem, we'd go out and see what it was. It would be anything from an apparatus that sat on a table to a full turbine power plant operation, which was kind of fun.

G-E has a broad range of apparatus that is covered. We didn't get into medical things or some of their other spinoffs or their electronics, but anything that was sold as called apparatus. That was a division. I sold through that sales office, and we went out from that office. But I

only had three months there, and it was just enough to see what they did as sales people and engineers and managers and so forth.

Storey: So you never accidentally got sent to a Reclamation project on a generator or anything?

Lloyd: No, but we did have a Reclamation project, strangely enough, in the hydraulics laboratory that I mentioned earlier. The Holden Hydraulic Laboratory was a good one, a little one, an old one in Holden, Mass., near Worcester, run by Worcester Tech, and they did modeling work for Hungry Horse [Dam] for the Bureau. Some aspect of it, I'm not sure what all. But they had a model set up, and they were doing some hydraulic modeling and setting up.

Storey: But you weren't personally involved?

Lloyd: No, but I do remember seeing that and saying, "Gee, that's pretty exciting. Hungry Horse. The West." You know, some of the appeal, I guess, of the Bureau was to go west. You know, I wasn't married at the time, and it seemed like a good place to go. That had a lot to do with hooking up with the Bureau. My whole background was the East, farming in the East, and manufacturing, and people work for big companies, didn't they? Well, I did for a while and then a small one, but then I ended up with the Bureau in the West. I loved it. I mean, skiing, and then my real passion, I guess, is trout fishing, that was out here, too. So I just wanted to go out and see.

Storey: I mentioned to somebody on Friday that I was having trouble getting hold of you, and they said, "Oh, he's out fishing." (laughter)

Lloyd: (laughter) I [unclear] two weeks ago.

Storey: Where did you go after Harris Transducer?

Lloyd: Back to G-E Syracuse. There they were building–well, it's the same outfit that was buying the transducers, and they were building transducers there in Syracuse and sonar

equipment. So I worked at that for three years, I guess it was, two or three years.

Storey: Did you change jobs or had Harris Transducer been absorbed?

Lloyd: No, I changed jobs.

Storey: You changed jobs back to G-E. Doing what again now?

Lloyd: Design and development.

Storey: Of?

Lloyd: Transducers.

Storey: Of transducers.

Lloyd: There we are.

Storey: For three years?

Lloyd: Yeah.

Storey: Then where did you go?

Going to Work for Reclamation

Lloyd: The Bureau–Denver.

Storey: How did that come about?

Lloyd: Oh, I just talked to people that were familiar with [Department of] Interior and talked about the West and wouldn't it be great to be out there. So I looked at the post office, of all things. There's a whole bunch of ads, a whole bunch of material. They were advertising for electric people, communications types. It was broad enough to say, "Well, gee, I can qualify for this. Let's see what it's all about."

So I applied, and they said, "When can you be here?" It was during this time, as I was telling you, that they were swamped with the need to get designs out.

Storey: You just sent in an application?

Lloyd: Uh-huh.

Storey: Do you remember to whom you sent that application?

Lloyd: It was the Denver Office, the same one that Terry was telling you about, with the birds in it. That's where it all took place. I remember the day of being hired in. They had a rotation program at that time in the Bureau for new hires, the engineers and others. I remember that the personnel person took me down to the front office and said, "Here's our new one, a new engineer." And it was Brewster Rice, I think it was, I have forgotten his name, but he said, "God, he looks old enough. Why don't you put him right to work?" I think he had visions of putting me right on the drafting board.

I said, "Well, we'll give him a little look here and there." But as it turned out, I went into the Technical Section and stayed right there full time and did not rotate out and around the Bureau. I stayed in one office, one unit. There was plenty going on, and I seemed to be a match for what they needed.

Storey: When was this?

Lloyd: '61.

Storey: 1961. And what were you doing there?

Designs for Power Systems

Lloyd: We were putting together switching arrangements, designs, for the power system that had already been–well, I'd say not committed, but, yes, committed because of the authorization of all the power plants. There was then a need to pick up power and transmit it rationally to the various low points and to the other systems and tie the whole works together. So we had to put together schemes and systems to do that. So we were doing feasibilities. We were giving management several choices, and then he'd

come back and say, "Okay, this is the one we want. Get a little more detailed." And then turn it over to substation designers, people that really got into the nuts and bolts. They ended up with drawings that could go into a specification. Not me, but others would convert that into specifications, go out and get a substation built or transmission line built.

Storey: So you were conceptualizing the transmission system?

Lloyd: Yes, at a second stage. In the section I was in, there was two parts. One were doing the conceptualizing with the aid of an analog computer. They would actually put it out, put it all together, and then you'd go out and plug it into a board. A board had all the generators on it, the lines, the loads. You'd plug this whole damn thing together. It was arduous, I mean, it was a lot of work. Then you'd carefully run through to see how the power would flow. Didn't say what mountain you'd go over the top of or how heavy the conductors were and all that detail, but this gave you the first conceptual view. You made many of those runs. They still do it today, but you do it with a computer. It's neat and it's fast and accurate. You don't have to have five guys setting this thing up and then running for four days.

We had this big analog computer there in the E&R [Engineering and Research] Center where the conceptualization, the initial one, was done. I spent a little time in that, but I spent more time in the next stage, I guess, or peripheral to that, and that is putting together the practical hardware that would serve these lines that were drawn all over the West. That is, how you would put the substations together, how you'd put a series capacitor together, a station, what the compensation had to be. There was engineering decisions that had to be made before you ordered equipment. That was it.

For instance, you'd be ordering these huge transformers. They were–how can I describe them? They were 500,000 pounds, loaded. I

mean, you've seen them. They were real heavy stuff. We can't see them on the drawings here. We would put together the specifications for those transformers and the reactors, the capacitors, the switch gear, the circuit breakers. All that had to be purchased once you've gotten the concept together. So we were providing the people who did the actual assembly of the specifications with the technical requirements in order to do that.

Storey: So you were writing the specs.

Establishing Requirements for Specs

Lloyd: Not quite. We gave the requirements, and then somebody else did it. It was a hell of a bureaucracy, but, nonetheless, we were specialists in equipment and also the setting of the relays. The relays are the protective devices that keep the power system from tearing itself apart. If you have the wind blow down a line or airplane fly into it, heaven forbid, or somehow get a short circuit, that line has to trip, and now. Then under controlled circumstances, you want it re-energized before you've lost its service forever, or at least for the next hour. All that had to be set up, designed, the conception put together and specified in our shop.

I'm sorry. I used specification–I say prescribed. The actual specification with all the nuts and bolts and all the hardware and the penalties and all that was put together by a different group, substation design or control design. But we would provide the technical basis for their preparing a spec.

Storey: So let's see if I have a conceptualization that's right. You would know from a conceptual design, "We're going to need a substation here at point X."

Lloyd: Right.

Storey: "And in order to do this, we are going to have to have this many transformers of these capabilities. We're going to have to have this many relays,"

whatever that technical equipment is. Then it would go to the next person who would say, "Okay, in order to hook up the transformer, we have to do this and this and this and this and this." And they would write up, basically, the contract for purchasing the equipment?

Lloyd: The invitation to bid, that's right.

Storey: And installation of the equipment. Okay. So you were sort of an intermediate design stage, if I'm understanding this correctly, saying, "In order for this to work, we have to have this capacity. In order to have this capacity, we have to have this many transformers of this capability, and these are the other things that go with that to make it work."

Lloyd: That's right.

Storey: Okay.

Power System Technical Section

Lloyd: So we were called the Technical Section, the Power System Technical Section, and we were supporting the substation designers. There was another group, the Control Group, that took the relay information, the concept that we had, worked that up and made it a part of the specification, too. That was so specialized an activity that the Control Group was separate.

So there was really three of us, I guess. The Technical Section who would pass it off to the Substation Group, and the Substation Group would take its material and add it to the Control Group. They would work closely together, too. But between the three of us, you got a package out that said, "This is what we want, we have equipment and construction. Do it. Here is the schedule, and here's all the business provisions and the contingencies and the schedule that's needed and foundations and strengths of materials from A to Z," was put together and specifications issued. That was the product, finally, of the Electrical Bivision. It was a division, yes. Branch–Electrical Branch. Sorry.

Design Division, Electrical Branch.

Storey: And did one of those three sections, I guess they were, then go out and inspect the work?

Lloyd: No, they could if they were called in, but normally there was a Construction Division who had an Inspection Section that took care of being sure that it was put together the right way. If they needed help, they called any of us.

For completeness, I must say, there was a Powerplant Group, also, that did similar work, but it was solely for power plants, not for substations, not for transmission, but for everything that was in the power plant.

Storey: Electrical.

Lloyd: Electrical.

Storey: You were all in the Power Division, did I hear you say?

Multiple Sections in the Power Division

Lloyd: Yes, yes.

Storey: So this Powerplant Division was in there, also?

Lloyd: Yes, it was. It was very important.

Storey: So it might well be, for instance, that the powerplant section would be designing a powerplant and the other three branches would be working on designing a switch station to go with it.

Lloyd: Absolutely. That's right.

Storey: Was there a separate group, then, to design a transmission line that went into this?

Lloyd: There was. There was a separate group that did–as I recall, they were part of the same room that substation was in. I'm losing track here, but they were strongly into the civil aspects of design. They had to be careful about clearances

and voltages, of course, and insulator strings that they met all the requirements of the environment; that is, icing, the wind, the rain, the whole works. But their big blow, big problem, was to get strength in the right tower spacing, the right number of towers. So they drew heavily on a group that was located off there that was in structures, that came from structural and architectural.

I'm taking you far afield from electrical, but those guys were very important. Between those structural types and the small cadre that were there is substations, they put together the transmission line spec. They said, "Here's what we want." Specific to every tower, how every tower is designed, as Ray told you, the sag, the whole works. It was an art and science all to itself and easy to draw on the paper, but then there's lots and lots of detail work that had to go into the specifying of a transmission line. Two hundred miles, there's an awful lot of towers. Now, they tried to standardize, but each one of those the locations was a little bit different. The foundation requirements are different or the extensions had to change. It was all in there. The contractor had to know what he was bidding on. So they did.

So we were putting out, I guess, in summary to help understand what we were doing in power, we were putting out substation specifications, transmission lines specifications, and powerplant. But that was pretty much it, those were the three big products. Then there was intermediate replacement apparatus and so forth that went along, but those were the new and important big items we had to deal with.

Storey: Am I hearing about maybe four or five sections?

Lloyd: Yes, that we were working on.

Storey: In a branch called–

Lloyd: John Baptist, Chief of Power. Let's see. Design Division, and it was Electrical Branch. It was the Electrical Branch of the Design Division.

Storey: And then do you recall the sections of the branch?

Lloyd: Yes, we had sections under the branch, and one was a Substation Design. Another was control. There was Power Systems Technical. The one I was in was broken two ways, but don't confuse that. And the other one was powerplant. That's four. Now I'm lost to whether or not transmission lines had a–I think organizationally it was part of substations he worked for. I'm seeing now who reported to whom. Part of substations was transmission lines, and they were supported by a structural and architectural guy, or a number of them.

Storey: Who were in a different division.

Lloyd: Who were in S&A. Who were the Structural and Architectural Branch, I suppose. Still part of the Design Division. So we were putting together designs with outside help. Usually we issued them and did the designs. On a few occasions, they tried outside contractors to do the designs and the construction. A lot of grousing and complaining about that, but I think it worked. From what I heard, though, there were lots of glitches. I mean, because we weren't used to supervising them properly, and it could be partly because we didn't want to lose the work. I'm not in the position to say except to know that that was the beginning of contracting to the "out" for design work. But the amount of business in those ones you just described, transmission lines and the substations and the powerplants, was big enough to require a lot of work.

Storey: Do you remember who your supervisor was?

Lloyd: Dan Clark was my supervisor and, before that, Clark Rose. I think Clark Rose may still be with Western Area Power Administration. Dan, I don't know where Dan is. But I remember John Baptist was the Chief of Power, of the branch. Roy Nitta, Roy was the assistant. He became the chief. Roy was from Durango, I think it was. His dad was an engineer–was he?–on a narrow

gauge railroad.

Storey: Oh, really?

Lloyd: Yeah. Interesting people from the West that we met. I mean the Bureau, I must say, offered a lot of important professional employment for folks that otherwise there wasn't much. You'd have to move out of the West to get the type of work that was going on.

Storey: Do you remember your grade when you came to Reclamation?

Grade Raises

Lloyd: I think a seven. I think they gave us a little hitch because it was engineering, you know, a little move up in the spread of things.

Storey: How long were you a seven then?

Lloyd: Gee, about a year. I moved right along pretty well.

Storey: You became a nine then?

Lloyd: A nine and an eleven. Yeah, I thought, gee, by the time I got to twelve, I was on top of the world. It was really great.

Storey: When was that?

Lloyd: Let's see. It must have been mid-sixties–'65 or something like that.

Storey: Do you remember what the section chiefs were graded at and the branch chiefs?

Lloyd: Fourteen and fifteen, I think.

Storey: So a division chief would have been?

Lloyd: Higher. I'm lost.

Storey: Higher.

Lloyd: I'm pretty sure.

Storey: How did the work in your section go? Did your supervisor come in and say, "Okay, here's one we need designed. This is yours," and he just handed you the project? How did this work? Was it a team?

END SIDE 2, TAPE 1. DECEMBER 6, 1994.
BEGIN SIDE 1, TAPE 2. DECEMBER 6, 1994.

Storey: This is tape two of an interview by Brit Storey, with Lester W. Lloyd, on December 6, 1994.

. . . how the work was actually assigned and carried out in the section you were a member of?

Work Assignments

Lloyd: Oftentimes, the separation was on a technical basis. That is, if it was a relaying question, why, it went to Dick World, and whoever was working for Dick. If, on the other hand, it was a switching question, Clark Rose, when he was in charge, would assign it to one of us. Or, finally, when I took over Clark's position, I would assign it to someone, or do it myself. And we would just keep the pipeline filled. I'd try to keep track of the time it took, and do some managerial-type things, but generally, people took on what they could, and depending on their specialty in the division, or in the–I'm sorry–the small unit.

Storey: So, pretty much, these efforts would be individual efforts?

Lloyd: It finally came down to an individual effort, that's right. They were subject to review, of course, and discussion. I know the relaying people very carefully talked about, before they went into the trouble of all the calculations–they had to go through arduous and careful calculations, with all the contingencies–they would talk about what they were going to do, in the way of concept, how they were going to protect this system, so they didn't waste a lot of time. Then they went ahead and selected, and did the calculations, and then there was another check by the senior person. That worked very

smoothly that way.

With respect to the other things, the switching questions, those were also checked. Fall calculations were checked. But they were done on an individual basis. It wasn't a large team effort. The biggest team effort that I ever recall was when we ran that large analog computer. It's plugging the system up, and simulating how it would operate, and taking measurements, and drawing conclusions about how power would flow throughout the West as a result of whatever we were going to do.

In fact, the Bureau provided a lot of insight for the power system people throughout the West, in this period of expansion. Others would come in–Arizona Power, Public Service of Colorado–they all were involved in the output of these sites. They didn't actually do them or provide the grunt power. We did them, because they were Bureau-initiated, but they were very interested in the results, and looked them over.

Reclamation's Power Systems

There was a man named Harvey Hunkins. Harvey was a true expert in this area, and very highly regarded by the other power systems people throughout the West that did this study work. Fortunately, they finally converted into the digital process, the computer modeling, and it went a lot easier than having to do the team version involved in running and plugging up the whole system on a board.

Storey: Did that happen while you were still there?

Lloyd: Yes. We were strong into it. And the Bonneville Power Administration was, of course, very strong. I say, "of course." I mean, they had many more resources in power–that was their sole function–than we did. But they put a lot of horsepower into the development of new programs, and application, and were successful at it.

We did some work where we had to contract

with people like Allis-Chalmers, Westinghouse, or G-E, to get transient studies. When you switch the system, there are voltage spikes and current spikes that have to be dealt with, and they're very difficult to calculate. They can be today, but at that time, those had to be simulated on a separate kind of a simulator, in order to be sure your designs were going to stand the rigors of real life switching out on the system. So we would go to–I enjoyed that much. I went to G-E a couple of times in Syracuse–I mean, Schenectady–and to Allis-Chalmers in Milwaukee, and ran some simulations with these other engineers, and that was good experience. Yeah, that's a long time ago. If I'd known that was going to be the subject, I would have done a lot of homework. [Laughter]

Storey: Do you remember when the transition took place between analog and digital computers?

Transition from Analog to Computers

Lloyd: Oh, it was a slow transition. The Bureau left behind–they kept the analog when Western Area Power Administration peeled off from the Bureau. It was retained as a training tool, not as an analytical tool, but as a training tool for power system operators. It was converted and moved around, I believe, to simulate power system conditions, so you could see what happened when you did various things. They may have done something more sophisticated than using that old system, but that's what I recall happened to it. And so when the break-off took place–you'll have to help me–

Storey: '77.

Lloyd: Okay, okay.

Storey: I believe.

Lloyd: So probably it was around until the early seventies, but it was fast going by the early seventies. No one date. I think when the Bureau–the Bureau probably one day said, "No more. We're not going to spend any more effort

on running simulations on this thing. We're going to do it either outside, or with Bonneville, or we'll do it with our own computer."

Storey: So the transition from the analog to the digital didn't happen while you were still in the Denver Office?

Lloyd: No. They were still using the analog, at least for some problems, when I was there. But not long after, they relegated it to a training tool, and now it's totally gone, I believe.

Storey: How did your duties and responsibilities progress while you were there in the Denver Office? I presume they changed over time, as your grade increased.

Changing Responsibilities

Lloyd: Yes. I think they were successive and logical, because I didn't have any sidetracks. I stayed in the same type of business. That is, design support. I guess what you'd say is, I went from a 7 to a 13 in that period, in a ten-year period, with successively more responsibility, at least in terms of numbers of people supervised.

So I guess, then, the question would be, "Well, why?" The reason, I guess, that I was a contender for the job, which was the Assistant Regional Supervisor of Power in Billings, which was by far the biggest power division, in terms of numbers of customers, transmission line, generating plants, not our generating plants, Corps of Engineers, but it was the biggest power system in the Bureau at that time, at the time they went to Western [Area Power Administration], was that I had some technical background in all the apparatus, and perhaps enough administrative experience to qualify at least as somebody to go out as an assistant. And I had worked with the Billings people pretty closely in the time that they came down, and would do some of these simulation studies, or other work. They were looking for somebody to back them up, up there.

So I think there was probably, now that I look back at it, a certain awe that the regions were forced into about the great wealth of wisdom that's down at the Denver Center. For instance, they had their own training programs. They have excellent people that are still with Western Area Power Administration that were in the region, administering parts of the power system, technical and administrative parts, when I arrived. But I think they felt they wanted somebody from the Regional Office, for a little different perspective and outside experience. I can't differ with that, especially when it was to my benefit. (laughter)

I'm just saying that there is a certain amount of feeling that there's all wisdom down there. And when I got to the Regional Office, I found out that, of course, the technical aspects went almost to zero. It was people considerations, and marketing considerations, and business aspects of marketing this power, generated by the Corps of Engineers' facilities and a few of ours. Yellowtail[8] and Canyon Ferry[9] [dams] were the only ones that we had. The Corps of Engineers had the bulk of the power generation, and it was quite a different life. And it was a shift for me to get into that type of work, but I got along well enough with those aspects, and the customers, and the environment, so that I moved on into the Regional Supervisor of Power, and then from there, into general water management, as well as power, as an Assistant Regional Director.

So my loyalty, I guess, to the Bureau got

8. Constructed in 1967, "Yellowtail Dam, at the mouth of Bighorn Canyon, impounds flows of the Bighorn River for multipurpose use." The dam is a primary feature of the Yellowtail Unit in south-central Montana, to provide flood control and power generation. For more information, see "Pick-Sloan Missouri Basin Program Yellowtail Unit," in *Project Data*, 1013-1022.

9. Located 50 miles downstream from where the Gallatin, Madison, and Jefferson rivers join to form the Missouri River in western Montana, Canyon Ferry Dam is the primary feature of the Canyon Ferry Unit. It is a multipurpose project to provide flood control, hydroelectric power and irrigation water. For more information, see "Pick-Sloan Missouri Basin Program Canyon Ferry Unit," in *Project Data*, 815-820.

stronger and stronger as I moved on through. I said, "Gee, well, they have this kind of feeling about me, I'll stick with the Bureau." And then when power took off, I mean, it had kind of taken part of me, but, on the other hand, I said, "Well, gee, I like Billings, people I work with. I know a little bit about the water business, and maybe I'll learn some more." So I stuck with it, and I'm glad I did.

Storey: Tell me about how you became a section chief in Denver.

Section Chief in Denver

Lloyd: I'm trying to think who bumped out and moved over.

Storey: Somebody named Rose?

Lloyd: Yeah, I think so. Clark was always in there strong. Clark got the job, I think, of design and management of the Bureau's portion of the D-C tie. Did that come up anywhere in your discussion? The D-C tie was a big, big technical and power deal that couples the central part of Columbia, near The Dalles, to Los Angeles, one giant, 2,000-mile, direct-current link, and tremendous amounts of power that they had surplus at that time from the Northwest out to L-A, and then, theoretically, in reverse.[10]

Well, Clark got it. I think he went to work on that damn near full time, and they opened up the job, and I was in the right place at the right time. Let's see, now wait a minute, I didn't go as the power system technical. No, I left as a 13 and went to a 14 in the region. That's what happened. See, I was still on power systems technical section A, A and B. "A" was the design, the apparatus, and "B" was the system concepts, running the computer, or the analog.

10. Believe Mr. Lloyd is referring to the Pacific Northwest/Pacific Southwest Intertie, which connected Reclamation power facilities with West Coast private and public developers. For more information, see Toni Rae Lineberger, "Pacific Northwest/Pacific Southwest Intertie Project," Denver: Bureau of Reclamation History Program, 1997, www.usbr.gov/history/projhist.html.

And I was in charge of A, when the call came, "There's a job in Billings."

Storey: So that was the section chief?

Lloyd: Well, the job in Billings was–

Storey: No, in Denver.

Lloyd: No, no. Power Systems Technical Section. Yes, that's right. Yeah. Let me see if I can get these right. I don't think I even put that in. [Referring to notes.] Let's see.

Storey: What made you apply for a job out in the region? A lot of people come to Denver and they never move. They never go anywhere.

Transferring to the Region

Lloyd: Oh, I think Bill Graham, who was the power supervisor at that time, was a very convincing and interesting guy, and he did a sell job, for one. Frankly, I mean, living in Montana would just fit in my idea of paradise. And it turned out well. I was really pleased. Billings is a great spot. I miss it. We didn't hesitate long to make that move.

Storey: In effect, if I think I'm hearing through what you're saying, Mr. Clark–

Lloyd: Yes, Dan Clark.

Storey: –who was the head of power in Billings, wanted you to come?

Lloyd: No. His name was Graham. Clark was my boss. Clark was my boss in Denver. He remained there in that slot. Clark Rose was out doing some other things on assignment. Harvey Hunkins was running B section, and I had the A part of Dan Clark's Power Systems Technical Section. And I think I was a unit chief, that's what it was, in the power systems unit.

Storey: Under a section?

Lloyd: Under a section, yeah. It had to be, because Dan was the Chief of the Power Systems Technical, and then he had broken it down at least two ways. I was one of them, and Harvey Hunkins was the other. Clark Rose was out there doing something for the D-C tie, the one from The Dalles.

Storey: Which was a Reclamation project?

Lloyd: Partially, partially. They put up some of the monies. Bonneville was by far the lead, but the Bureau got deeply involved in it.

Storey: Who was it that thought you ought to go up to Billings? Was it you, or were you recruited, or how did this work?

Lloyd: I was recruited, in effect. There was Bill Graham that made the selection, I presume, and got it approved by Harold Aldrich. Harold Aldrich was Regional Director at that time. So they wanted somebody to help them out up there in what all was coming, although come to think of it, there was not that much expansion going on. I'm not sure what Bill's true motivation was, except to get some help. I think he probably felt that some of the technical stuff he was not all the way up to speed on, although there wasn't any great demand in that area.

They did do some expansion of the control facilities. The dispatch office, the Montrose of the Missouri Basin, was at Watertown, South Dakota. That may have been part of the reason for it. But, yeah, moving to the region is–I don't know how flexible they are today, in doing that. It depends on how much pressure is put on, I guess, by reorganizing, whether people move or not.

Storey: Nowadays there's a lot of that. As a head of the "A" unit, were you a supervisor?

Supervisor of "A" Unit

Lloyd: Yes.

Storey: How many people were in that unit at that time?

Lloyd: Seven, I think.

Storey: When did you make the transition? You made the transition from being a member of the unit, to sort of heading up the unit?

Lloyd: Yes.

Storey: And you got a promotion from a 12 to a 13, am I reading this correctly?

Lloyd: Yes, that's right. That's right.

Storey: What kinds of new things did you run into as a supervisor that you hadn't run into before?

Lloyd: Well, I must say that with a small unit that ran pretty well before; at least there was no acrimony and no difficulty in getting the jobs done. There were no great personnel problems or revelations. The pressures were high to get the work out. At least I felt they were, at times. And so I guess there was the anxiety of being in charge, nominally, and then being accountable for meeting schedules, whereas before that time, I just took my job and did the best I could to get it out on time. I guess time pressures, you'd say, were the strong issue. I don't recall that we had any great squabbles over work conditions. We moved to the new building about that time, too, to the new high-rise, the building you're probably currently in.

Storey: Building 67.

Moving into Building 67

Lloyd: Yeah, we moved out of the "birdhouse" into the skyscraper.

Storey: Tell me about work conditions in the two areas, the old offices, and then the new building.

Lloyd: The new building was fine. But what was wrong–I'm starting to think about how quickly we find something wrong, though. I guess the

breezes blew in strange ways. The heating and ventilating system didn't seem to be perfect. Neither was it in the old building. The old building was fine. I had no problem with that. We were on the second floor, and enclosed. We weren't in the great open area that Terry–I think Terry was in planning at that time, and he was adjacent to the drafts-people, who were covering up their tables and so forth, the designers. They were down there on the fourth floor. But it was an improvement, no question about it. It was a nice improvement, but the building was kind of a disappointment. It leaked, elevators didn't work right, and there were real problems with it. We were happy, for the most part.

Storey: Was it something that folks had been anticipating, completion of the building? Was there a lot of excitement about it?

Lloyd: I don't recall that, no. It just meant that one day you were going to report to another place. Now that may sound–I guess I wasn't there, and for me, things were moving along, so I didn't dwell on it. You know, if you've been there perhaps for twenty-two years, or twenty-five years, that would have more of an impact. But, gee, it's just one more thing happening. Then after a few years there, I moved on to Billings, to sort of go on with that. So it wasn't as if it was a great shock, as far as I was concerned. Nor did I hear that from anybody. In fact, they expanded and they were consolidated. Expanded in space, and consolidated, so people weren't running all over the place. It was an improvement, no doubt about it. There were things to complain about, but never been in an outfit where they didn't about something.

Storey: What kind of training did you have to take in order to be a supervisor?

Supervisor Training

Lloyd: One of the training sessions–I can't recall them, but there was managerial training that was sponsored by Civil Service Commission, or who ran it? O-P-M [Office of Personnel

Management]? I can't think of the agency, but I remember going to–oh, I remember, we had an organizational development-type person in personnel, who ran some courses there in the E&R center. You know, internal-type training, try to get people aware of their fellow worker, what's involved in supervision. It was either Civil Service Commission or another central agency. it wasn't the Bureau that ran one where all the agencies could send people to Boulder. Those are the only two I remember when I was there. But then, of course, as time went on, practically one a year. Once you get to 14, and all, in the Regional Office. I mean, personnel people watch over you pretty carefully, and make sure they give you all the breaks that they can in the way of assisting you in the training. I thought that was good. They really did a conscientious job in spotting people that needed to have it. They may have had the technical skills, but probably needed some supplement in the way of managerial and people skills. Saw to it that I got to quite a few of them.

Storey: After you had moved to Billings, you were working for Mr. Graham, is that right?

Lloyd: Yes.

Storey: What were you doing up there?

North Central Power Study

Lloyd: First thing we did was the most controversial one. One of the most controversial I've ever become involved in, I think. And it was to put together a great report and concept on how the coal fields of the Missouri Basin could be harnessed to provide 50,000 megawatts of power, mainly to the East, but also to the West. We put that North Central Power Study[11] together, and then it hit the proverbial fan, with the environmental community, and they said,

11. For more information, see Coordinating Committee North Central Power Study, *North Central Power Study: Report of Phase I*, Volume I, October 1971, https://archive.org/stream/northcentralpowe1971unit#page/n1/mode/2up, (Accessed December 2016).

"What is this monster?"

What was the name? Jim Smith. Jim Smith was an executive with one of the Midwestern power companies, who was Assistant Secretary of the Interior at that time, and he, by gosh, wanted this done. And Bill Graham honchoed that. Bill had a lot of us working, and I almost full time, on putting together this report that showed how we could do this job, which harnessed this public coal for the greater good.

Well, the environmental community really came unglued, not only locally but throughout the country, over this terrible deed of putting all these smokestacks in the Marlboro country. And it hasn't quit yet, since. Montana, I think, as a result, has got the highest coal severance tax in the nation. I mean, like 30 percent. They don't sell much coal, but they've got a hell of a tax there, when and if they do.

But the North Central Power Study was pretty exciting. Bill was a doer. He got it done. But it didn't go without lots of struggle and strain. Shortly after that was completed, it seemed to be it was shortly thereafter, Bill went on to Washington as Chief of Power.

Storey: When was this?

Lloyd: That was probably in the mid-seventies.

Storey: You went up about '71?

Lloyd: Yeah. And I think in '74 or '75, he went back to Washington. When he got there, why, then they needed to replace the Supervisor of Power, and I took the job on.

Storey: Tell me what went in to the North Central Power Study. That would have been just after the National Environmental Policy Act was passed. How did you go about doing this?

Putting the Study Together

Lloyd: Let's see. They had a number of committees.

They generally always had a Loads Committee. This is what you'd want to serve. Then you have a Resources Committee. This is how you're going to generate it. Of course, the answer to how you're going generate it was a given, in this case. It was to be a great coal field powerplant. I think there was a transmission group, also, who would conceptually design a transmission system to haul this power, and they'd run the studies that went along with it, to see what was required to ship it from Coal Strips, a vicinity in eastern Montana, to the various load points.

So they had all these committees, and then they had public meetings. Well, wait a minute. They had meetings of the committees. They may not have been too public. That may have been part of the hue and cry, as I recall.

But there was not an Air Pollution Committee, I can assure you there wasn't. (laughter) There was a Water Committee, one that had to get the water to cool this baby, and that was no small issue in itself. That would have taken a large quantity of water from the Yellowstone [River], or heated a large quantity from the Yellowstone, at times of the year. So that was a controversial aspect of it, also.

But it was done through committees, and the committee membership was all the potential beneficiaries who would like some of that low-cost power. That wasn't just the public power people. It was private enterprise, too. And this was due, I think, to Jim Smith's leadership. I can't think of the utility he came from, but he got Montana Power, and P-P&L, and all the biggies to at least play along with this study, and say, "Sure, let the Bureau go out there, and put out this thing, and see what happens." It didn't fly.

I think Smith's idea was that he could be sponsor and a catalyst, and get the thing accepted. The Bureau would play a role, but it really would be a use of the resources. I don't think there was any ill motivation there at all. It

was a way of serving.

But at that time, people thought it was going to go on forever. Load growth, and how are you going to supply it? Well, instead of shipping the coal in boxcars, which they do today, we'll ship it over transmission lines. It made a lot of sense. It still does, in lots of ways. Slurry pipeline is another way of shipping that coal, that resource, to where it's needed. But that, too, takes water. Not a great deal, per unit of energy, but still [controversial].

All of these had impacts that some of the local Montanans–landowners, League of Women Voters, environmental groups–rose up and said, "How dare you suggest that we can accept this kind of planning?" They were not–underscore, they were not–there was no environmental committee at that time brought in to try to mitigate, or explain, or put on scrubbers. As I recall, I don't think that scrubbers were even part of the study. I'm really having to stretch. I don't have a copy of the old report.

Storey: When was the study actually–when did it [come out]?

Lloyd: '77, I think, it was finally sprung, or '76, '77. And it got a lot of attention on that side of the world. Now, Bureau-wise, it was not a big deal. Bureau-wise, that's very limited. It didn't have a Bureau-wide impact, except to say that maybe you'd better be careful about how much involvement you've got in new coal-fired plants. Well, the Bureau got involved in coal-fired plants elsewhere. They got involved in the power to–what, down in Arizona. They owned a piece of it. That was for desalting. It was thermal energy for desalting.

Storey: Yeah, and we purchased one of those–part share in one of those Four Corners plants, in order to have the electricity to pump the C-A-P water, I believe. At least according to Mark Reisner in *Cadillac Desert* we did. (laughter)

Lloyd: Well, you got to get it somewhere.

Storey: In these committees, were each of the committees headed by a Reclamation employee?

Lloyd: No. No. Graham was the study manager, but they were headed by various people. I had the Reports Committee, and we were very small. All we did was bring together the material. He was looking for something for me to do in this area at that time. I mean, I was fresh on the scene, so with small resources, we brought the report together. It was trying to sell concept.

END SIDE 1, TAPE 2. DECEMBER 6, 1994.
BEGIN SIDE 2, TAPE 2. DECEMBER 6, 1994.

Lloyd: –of the North Central Power Study was not overwhelming, to say the least. There was a lot of controversy. I think today the only significant generation that's there is the local company, and that's the Montana Power, and they do have coal field generation facilities at Coal Strip, for export, that are not sold for in-state use. But it's very restricted. They pay a big fee to the state, and they've done a lot of mitigation work. I mean, they have brought in playgrounds and schools and heavens knows what else, in order to get this job done. It was just too much too fast for people to even accept, at least the opponents.

Storey: But it wasn't really a Reclamation project?

Reclamation's Involvement with the North Central Power Study

Lloyd: No, it was not. It was a service provided.

Storey: We were providing a service to a lot of interest groups?

Lloyd: Well, remember, though, the Interior had coal-leasing thoughts. Even the Indians, associated closely with Interior, had some interests involved in this. So that coal resource was the real motivator. It wasn't the water. But the Bureau had the water, the knowledge, a power system, and some technical capabilities. And Smith looked around, I guess, and said, "There's the

outfit that can do this job for me."

Storey: B-L-M [Bureau of Land Management] had the coal.

Lloyd: Yes, right. And B-L-M was on the committee. Get the resources.

Storey: But it came out with Reclamation's name on the cover, I believe.

Lloyd: That's right. It was more than casual, because, of course, Reclamation set up the meetings. Bill took a lot of lumps, but not as many, I suppose, as the Interior people that thought up the whole idea in the first place. But still, well, I guess here in Idaho there was a similar small-scale version where our outgoing governor, Cecil Andrus, fought Pioneer Thermal Generating Plant, which used to be located east of us here, about 20 miles, for the same reasons, at about the same time. "We don't want that burning and smoke and corruption in our state, thank you." And the power company was dissuaded from ever putting in a thermal plant. It turns out it was a good deal economically for us rate-payers, but I don't think many people knew that at the time. But still, thermal generating plants are not that popular. They're a little bit more popular, or less onerous, than nuclear plants, I guess. Maybe in the same category.

Storey: So it took you about six years for this study to wind through the committee process and the writing process, publication. Is that right?

Lloyd: Gee, that doesn't–I've misstated something somewhere. I got up there in '71. It surely wouldn't be six. It might have been four. I'm sorry, it just can't–it would seem to me, soon after I was in there, we were talking about where–I need a few key points, when Graham went back to Washington, for example, or when the study was actually delivered, what the date was.

Storey: When did you become the head of the power section, had the power responsibility?

Head of the Regional Power Section

Lloyd: '76, I guess. '78. Yeah, I guess '76. So '75 might have been when that study was finally wrapped up. But we were answering letters and questions for at least a year afterward, that's true. There was a string-out of the thing because of all the questions that came. We have to answer them all, too. So it made a lot of work for the would-be planners of grand power systems. But it was, it was an Interior, really, in fairness, it was an Interior effort that Reclamation was given the job and carried it on.

Storey: What else did you do as Graham's deputy in that period of time?

Lloyd: There were needs to look into relaying problems, technical problems, throughout the region, and attend planning meetings with the Corps of Engineers, and the things that he couldn't do. So just general assistance, and learn the ropes about the regional power system. It's an entirely different culture than design. It was a big switch in the way of my ten years, roughly, experience in the Bureau before was pretty much solely power systems. And while you can use part of that in the regional operation, that is not the bulk of the activity. I mean, you cannot justify a Denver Office, and then having a resident expert solely devoted to the technical aspects. Besides which, we had a person in the Regional Office who was a relaying specialist, for example. So it was just general assistance to Bill, I guess. Whatever he felt he couldn't do, and my learning the ropes of the regional operation.

Marketing Federal Power

The marketing business was rather interesting and complex, in that you were trying to sell within the limits of the resource, which was different from hour to hour, year to year, trying to sell all you could of that power at a maximum return, and keep the politics from getting too hot, making sure you didn't give too much to this one, to the detriment of that one. And there were always struggles to get more of

that low-cost power. As time went on, that power looked better and better.

We, at one time in the Bureau, had two marketing specialists that went out, if you can imagine, selling this low-cost power, which we delivered to these little communities in the Missouri Basin, delivered to their back door, at less than a penny a kilowatt hour. In fact, when I was there it was six mils, a little over half a cent a kilowatt hour. In replacement of these little communities' diesel generators, which were always going out, but was the only source they had, until this huge power system came in, following the Corps of Engineers' and the Bureau's effort. And it was probably that factor that tied me in pretty closely to the Bureau's work at that time, and I said, "Gee, this is pretty important. These people out in the Missouri Basin didn't have very much, or they had diesel power generation in these little communities, and that wasn't very good."

But anyway, they wanted this power in the worst way, once they could see how expensive it was to generate it with diesel fuel. And, of course, since that time, the cost of oil has gone up and up and up, and the cost of that power is darn close to what is used to be. Maybe it's doubled, but still, a penny. Awful good basis. These little communities made a lot of money. They would take the proceeds they would get from the savings of using federal power, and build swimming pools and all sorts of amenities, and maybe more important amenities. I'm not trying to diminish their effort, but it became a source for them.

So it was politically an attention-getter, making sure their allocation was fair. And at the time I was there, we were still meeting load growth. In other words, they were still building, and we could sell surplus power until we reached–they were preference customers–until we reached the maximum that we thought we could sell from power. We could sell it to others, the private power companies, at darn good prices. So they liked it. They'd like it

permanent also, but they didn't have preference. And this was a political squawk that probably hasn't quit 'til today. I think it's still going on.

But these little communities, and cities–Moorhead, Minnesota; and Bismarck, and all of them, bought–not Bismarck, that's in M-D-U territory [Montana-Dakota Utilities]–Dickinson, they all bought this Bureau power, and were glad of it.

So the marketing aspects were really quite interesting. Then I got involved–let's see, '65–I got involved in–

Storey: Maybe '75?

Lloyd: Yeah. I slipped the clutch. We still had the coordination with the other power systems to deal with, the other power systems meaning our neighbors: P-P&L, Montana Power, Idaho Power. It was always necessary to meet with them, and discuss designs and operation problems, and headwater benefits, and innumerable things that contacts with others were important.

Storey: What's a headwater benefit?

Headwater Benefit

Lloyd: That's a fascinating one, that I don't know that you probably–it doesn't come up in too many places. But it does where a builder, say, of a power facility that's licensed under the F-E-R-C [Federal Energy Regulatory Commission], like Montana Power, builds a new dam, and they alter the stream-flow in the system, or they take advantage of a stream-flow in the system that's created by others. Let's put it this way, they take advantage of stream-flow that's created by the storage, say, that the Bureau built. They are receiving a benefit for which they have to pay. That's the law. And it's a long, arduous process that the old F-P-C [Federal Power Commission] calculated, and came up and administered, and then our operations greatly affected how much benefit they are to receive, or they did receive.

See, we built a dam just outside of Helena, a big storage dam called Canyon Ferry. And below that are five fairly large, almost run of the river, not too much storage, dams, owned by the power company, Montana Power. They all get benefit from that storage, because that's water–otherwise, it would have gone by when they didn't need it. But now we schedule the water by them coincidentally at a time they can benefit from it.

Then it's the F-P-C's job, or FERC now, to calculate what that's worth. And we pay a fraction of that to the federal government. The power company pays to the federal government, not to us in cash, but to the government, these headwater benefits. Arcane business, but that's the way the law was developed. I guess it's fair. They didn't get a total freebie, but damn near. It's not rigorously enforced. If they were to pay what it was really worth, it would be a good deal more, I think.

Storey: Were you involved much in marketing?

Marketing for Different Customers

Lloyd: Well, incrementally, sure. I mean, the grand marketing scheme, in the beginning–I think at the time when the dams all were put into operation, you had all this power on hand to design a system and put the salesmen together, go out and say to these little communities, "Hey, we've got something good for you," and convince them they ought to shut down, or not buy, their diesel plant, and wait for us to bring it. That was an open marketing process, to dispose of it, no question.

By the time I came along, it was more the big customer. The little ones were all set up. The transmission system was in place. But we had big ones, like Basin Electric Cooperative. Basin Electric was an electric generating cooperative. They took Bureau power, federal power, and melded it with their own generation, and put it back in the Bureau system. Paid wheeling charges for the use of the power

system. And so it was that kind of marketing we got involved in.

So there's just all kinds of complications in running the power system. How much you use our facility is to how much you should pay us, because you don't just tie this system together and then generate, and say, "That's it. I'll pick it up over here." You have to account to who's carrying it for you, at all times; emergency and normal circumstances. And then you come up with a wheeling charge. We spent a lot of time beating away at that.

Again, these power system technical studies, not that I did so many of them, but they were vital, having that technical data to simulate what's actually happening. They got so good at it that the simulation and the actual flow conditions were checked one to another, and you could see the match. The confidence in the digital system was high and great. So you could put up all kinds of things, but then you had to work out a marketing plan. Well, that isn't exactly marketing. In a sense, it's selling new power, but it's part of the administration of the power system. Fascinating. It's a fun business.

Maximizing Efficiencies

The people that really had a lot of fun were the dispatchers and the people that ran the power system in Watertown, getting maximum return for this energy, that is always available, from a system that's generating beyond your immediate obligation to serve. You've got contracts out there, and you add them all up, and it comes to 105, and you're generating 130. So you've got 25 units to market somewhere. Well, how do you best do that? Do you hold it back in the reservoir until the price is just right, or do you sell it to your friends? There's all sorts of things. You maximize your return, covering contingencies that you may have later on yourself.

But these exchanges, hour by hour, are what the dispatchers are doing. They're running their

system with a maximum efficiency, and getting rid of their surpluses at their maximum efficiency, also. You can look up on the board at most of these dispatchers, and look at their lambda, their number, and that's the incremental cost of the next kilowatt hour that they would generate. In other words, they know right where they are on the cost curve. And the more and more and more they generate, the higher the cost gets, because they're bringing on all the old junkers and all the old standbys. Pretty quick they're burning natural gas and oil, and that's way up in price. So you want to keep down below that. So you go over to the Bureau, and you say, "Instead of firing up my gas turbine, I'm going to buy from the Bureau." Well, the Bureau knows what this curve is, too, if they're doing their job. So the price is jockeyed until it fits.

That's at least some of the marketing that goes on. Not that I did that on a day-by-day basis, but that's part of the fun of operating the system. The people at Grand Coulee know about this sort of thing, but they are dispatched from Bonneville. Bonneville tell them what, where, when, and how much. They make the decisions about the economics, the needs, who will supply, and where they'll buy it from. System dispatch is a good one. It has a high technical content. I don't know how they do it today. Organizationally, they were part of the Power Division which I was in charge of, but they're pretty much autonomous. In other words, there was a GS-14 in charge of that, and then the power chief in Billings was a 15, but they pretty much ran their business according to the prescriptions that you gave, and got that power out. Did it reliably.

Storey: Well, I would like to keep going, but I've already run fifteen minutes over the time I promised you.

Lloyd: Well, you've been patient. I'm sorry. You want to hear about these things, and I stumble on through them. I wish I had some of the key dates. I'll go dig in my material, and when we

get back together again, why, maybe I can straighten those out.

Storey: Well, I really enjoyed it. I'd like to ask you now if you're willing for the information on these tapes and the resulting transcripts to be used by researchers, both inside and outside Reclamation.

Lloyd: If they've got the patience, I've sure got the will. Yes. (laughter)

Storey: Okay. Thank you very much.

END SIDE 2, TAPE 2. DECEMBER 6, 1994.
BEGIN SIDE 1, TAPE 1. MARCH 22, 1995.

Storey: This is Brit Allan Storey, senior historian of the Bureau of Reclamation, interviewing Lester W. Lloyd, also known as Bill Lloyd, in the regional offices of the Bureau of Reclamation in Boise, Idaho, on March 22, 1995, at about nine o'clock in the morning. This is tape one.

Let's see, Mr. Lloyd, I believe last time we were talking about your assignment in Billings, and you were starting to talk about marketing electricity and wheeling charges and all kinds of things I've never heard of before that I'd like to explore with you.

Wheeling Charges

Lloyd: The Missouri [River] Basin's power system that the Bureau and Corps of Engineers shared responsibilities in developing, that's the Corps of Engineers for the majority of the generation and the Bureau for all the transmission of the federal power, was a very large one. I think at that time it was the largest of any of the Bureau operations in that area. So the Bureau transmission system and the Corps generation and the Bureau generation comprised the federal system of the Missouri Basin and was a very large and important factor, not only from a federal standpoint, but any power user had to deal with or coordinate with, we had to also, the other direction, with the private utilities in the

region. And that exists, even today, I'm sure, with the Western Area Power Administration [WAPA], operating, maintaining, keeping that system up to date.

About the time I was there, that is in the seventies, in the mid-seventies, the federal power was fast being utilized fully and it was then up to someone to build additional generating plants. Of course, the private utilities were doing that on a regular basis, certainly far to the east, that is in Minnesota, Northern States Power, and people of that sort. But in the central region, why we worked very closely with the public power people, Basin Electric Co-Op, for example, very large what they called G-T, generation and transmission cooperative, that built the additional generation that was necessary.

But a large part of the power transmission that went with this expansion was over the Bureau system, the federal system. So we did have wheeling arrangements with these public power people and others and with private people, where we had capacity available on the federal system. We would integrate or help get the additional power from the new thermo-generating plants to the lobe, so that we then had a system that was comprised of the federal hydro and the federal transmission system added to was this new thermo-generation that was coming on, as I say, in large quantities, starting in the mid-seventies.

Private Utilization of Coal for Power Generation

Very little nuclear was added in the whole process, because coal was most attractive and best priced, best utility for purposes of expansion. Coal being in large quantities in Montana, Wyoming. A lot of coal, by the way, was being shipped out of the region. It was not shipped out over electric transmission.

We talked earlier about the North Central Power Study, which was a Jim Smith creation and/or concept that we followed up on. And, I

think, gave a good exercise of, but it was roundly defeated conceptually on the basis that it was just an awful way to ruin Montana's plains country by digging holes and burning coal and shipping the power out. So very little of that happened with the exception of, well there was a fairly substantial plant built by Montana Power at Coal Strip, and a few plants scattered around the region. But not to the extent that the northern states were–I'm sorry, that the North Central Power Study had contemplated. That was a great big operation that would sent power from the coal fields out in both directions, east and west.

So that was a kind of exciting time when the coal business was looking to be the savior for all our energy problems. Having been through some bad oil shortages and the need for more, and nuclear looking not so hot, why, coal became a very important factor, and still is, in that part of the world. I guess were it not for restrictions about sulfur content, why, they might not have done so well. A lot of that coal had low sulfur content and met emission control requirements and was attractive to people like Northern States Power and others who ship it off in unit trains, still today.

But then the easterners found a way to use their coal, too. Senator [Robert] Byrd [U.S. Senator from West Virginia] made sure that his part of the world didn't lose all the coal supply for the central part of the United States. They were talking at one time about slurrying, that is, mixing powdered coal with water, and pumping it to Arkansas, for example. That was a serious, serious concept that was finally shelved, partially due to the railroads' opposition to any kind of competition for transportation, such as a slurry pipeline, in lieu of railcars. So railcars are still the mode of transportation for coal, of that vast resource there in Montana and Wyoming.

I talk about this because we were intimately involved in the power transmission aspect and the planning through, as I mentioned before, Jim Smith's era, and even beyond that. I'm sure

today it effects Western's [WAPA] business, this coal resource and fact that energy supply people look to either the coal, boxcars, which doesn't have much to do with Bureau or Interior–does Interior, Interior has coal resources, and the Indians certainly have vast resources that Interior watches over through the B-I-A [Bureau of Indian Affairs]. But we were closely involved with that resource. It was a pretty interesting and exciting time.

Storey: Tell me about wheeling. I don't quite understand yet what the term means.

Wheeling

Lloyd: If you have a power transmission system of the high-voltage lines you see crossing the countryside that has spare capacity that can be reliably used. In other words, the capacity is there on a continuous basis, and if there's some spare capacity and someone wants to use that to carry his power across your system, you can make arrangements to do that. And they call it wheeling, and you're charged for it.

And you say, well, why do you have this spare capacity? Well, a number of reasons. One, you just have to build in surplus to begin with for contingency and outage conditions, but more likely the load in the generation will start shifting over time so that transmission capacity evolves without you having to build anymore, if you follow that logic. In other words, instead of it all flowing from west to east pretty quick in time, as over years, it starts flowing less and less from west to east and reverses and goes east to west, for example. Then you've got capacity available, then you should be able to wheel through that person's system or that company's system, because spare capacity now exists.

And if you can predict that for, say, a ten-or twenty-year period, then you can buy wheeling instead of having to build duplicate transmission. You look at the electric system as if there was one ownership, and you say, "What can we do with it without having to build more?" And if

you say, "Well, there's capacity there, this is the way I'd do it if I owned it all," then you make contracts to, in effect, take advantage of what exists. So wheeling is simply transmission right, and it's charged in cents or mills per kilowatt hour just like any other charge would be. So it's an efficient use of what exists.

Storey: And so Reclamation had wheeling charges as income?

Lloyd: Yes.

Storey: Where did those wheeling charges go?

Wheeling Charge Deposits

Lloyd: Into the Basin account. In other words, it would be income as would be the charges for the generation itself. It would be an income you could credit toward the repayment of the system.

To make sure I get the history straight, but power, unlike irrigation, power was not expected to be subsidized, other than have very low interest rates, especially low interest rates or zero interest rates for the component of power that was assignable to irrigation. In other words, if 20 percent of your power system was ultimately to be used for irrigation power supply, then that had a zero interest rate attached to it, and the rest of the interest rate was very, very low. For that system that I was talking about in the Missouri Basin, I think it was 2.5 percent, so that resulted in a very interest-sensitive businesslike utility. That resulted in very low power rates.

I think we said before in the Missouri Basin what this low power did, once it was marketed to these small communities that had diesel generation. It shut those diesel generators down that were isolated little systems all over the Dakotas. They then became dependent on this grid. The power grid that the Bureau built to distribute this Corps-generated power; now supplemented by the co-op's power generation

throughout that region.

I think probably those two states, North and South Dakota and eastern Montana, constitute the heartland, as it were, of public power in the usual sense. The great wars and the great battles of the philosophical argument over leaving people in the dark, doing washing by hand versus public power messing around with free enterprise, this was the breeding ground of the co-op movement. This is where the cooperatives became very, very strong, outside T-V-A [Tennessee Valley Authority]. You'll probably very familiar with what they did, that was more an area development in many aspects, I guess, chemicals as well as power.

But the power in that Missouri Basin was extremely important to those rural people and it worked the way it was supposed to, in my opinion. That is, it did bring power and low-cost power to small communities and the very rural people, the farm people, and really improved their standard of living a great deal. And served for a long time, as I said, that is, the power source, the hydro power source, until the mid-seventies, and then had to be supplemented by coal generation to keep up with the growth.

Storey: Did we have to cooperated with the Rural Electrification Administration [REA] to distribute our power?

Rural Electrification Administration

Lloyd: We had very strong authority that was, what will I say, coordinated through the co-ops. The cooperatives and the R-E-A, the Rural Electri–the R-E-A co-ops had funding and got money from the R-E-A, of course. They didn't get any money from the Bureau, but they did low-cost power. So they had an accounting and a funding authority that came from agriculture through the R-E-A, but we supplied the power to them. And so the coordination was simply as a provider and a buyer concept. I guess that's the easiest way to put it.

Storey: At that time, this was, I believe you said about '77?

Lloyd: At what time?

Storey: The time period we're talking about.

Lloyd: Yeah. The time I'm most familiar–well, between '70 and '77, say. In that era.

Storey: Did we talk last time about the–we marketed our power, right?

Lloyd: We did. We, the Bureau.

Storey: Who were our major markets?

Reclamation's Major Power Markets

Lloyd: Well, there was statutes that required that there be preference to preference users, and the preference users were nonprofit public outfits like municipalities, rural electrification co-ops, states. In other words, non-private businesses to supply power. They had the preference. If we had power we could not sell to them, because they couldn't accept it. We then could sell it to the private utilities in the area or in the industry and anyone else. Bonneville Power Administration had additional authority to sell directly to industrial users, and they still do today. That's a part of their system. It's a little more T-V-A-like then the Bureau. But I don't think we ever were involved in that unless we were Boulder City for the–

Storey: For the magnesium plant.

Lloyd: –magnesium.

Storey: At Henderson.

Lloyd: Yeah. So we've had very little of that. Ours was largely the public power people. The preference clause, that was the masthead. That's what you marketed under and any of your long-term arrangements, or wheeling, and for power went to those preference users, even the

wheeling and that was contentious at times, too. I think some of the privates would like to have had some low-cost wheeling, but they were told, and politically a lot of pressure and they'd say reserve that for Basin Electric or whomever, because we want to use it. We the cooperatives who are now going to supply the additional power to the region. They wanted that reserved.

So that was our market. Our market was largely, and most importantly, the preference committee. I guess in numbers there may have been 80 to 100, just having to guess. There wasn't a myriad. There wasn't thousands and thousands. We dealt with these cooperatives and all of them had farmer boards or whoever, or community boards, and hired managers, professional managers, who ran the power system for them, and they negotiated as best they could with the Bureau. There wasn't a lot of negotiation. I mean, whatever was available was allocated to them. That was a process that took some careful public stepping. That was to allocate the power growth to say, 100 customers. Let's say they're all legitimate. You had to look at their growth. They had to justify what they were reserved. They were reserved a block not to exceed; let's say it was five megawatts was their allocated amount. They could take power up to that level. Then they were cut. Then they had to go look elsewhere for power. But you had to make those allocations at five, seven, nine, twelve, all the way across, and it depended on their growth. So that had to be watched carefully so that you didn't run out, you didn't oversell, you didn't end up making a contract that you had to turn around and buy power from somebody else at very high rates to make it up. So there was a lot of statistical care that went into it.

Sometimes you took a slight risk, naturally. If water was very low, why, you wouldn't sell to the absolute rock bottom conservative. You might a sell a little bit above, but not very much. We never got stung, that I know of, for long periods of supply. In fact, we would run

accounts with other generators and we would provide them low-cost surplus power when we had it in return for replacement in time when they had it. So there was this constant trading, which was a fascinating business that was run out of Watertown [South Dakota]. The dispatch center that kept track of all these long-term, short-term opportunities and marketing arrangements. They had to keep track of the physical system, of course, what the capacities were.

Most importantly, they had to keep track what was available in generation, what the contract said, what the price of power was, and move it in the most efficient manner, as if you had one system again. That's kind of what the power supply people do is think in terms of what the best efficiency is and see what the contracts are to make it flow that way. So you're not burdening people with either shortages or high prices or non-supply.

Coordinating Power Distribution between Regions

So it was a pretty sophisticated operation that the Bureau had, and a very important one in that part of the world. That spanned from western Minnesota all the way to western Montana, where we faced up with Bonneville. Bonneville picked up western Montana and that part of the Northwest. We also coordinated with the other Bureau regions. I was trying to think, the most important one was Region Seven,[12] that is Wyoming, was covered by two regions. We had the northern part, and the southern part was Denver. We had some power shipment back and forth between those, but it wasn't major.

There was an interesting physical line of

12. Region 7 was headquartered in Denver, Colorado and referred to as the Lower Missouri Region. In 1985 the Lower Missouri Region and the Upper Missouri Region were consolidated into the Missouri Basin Region, operated out of Billings. In 1988 the Southwest Region (Region 5) in Amarillo, Texas, was closed and much of its operations and obligations were taken over by the Missouri Basin Region, which was renamed the Great Plains Region in Billings, Montana.

demarcation between the power systems in the United States, still is, I believe, through our region, that is the Missouri Basin, where on the West everything is tied together. The western systems of the United States are all tied together, one big grid. And the eastern United States is all tied together in one big grid. But there is a line down through the Rocky Mountain area where there are no ties. The systems are too big and too unmanageable to be able to tie together with just a few skinny lines. Any big disturbance left or right or east or west would tear up and break the connection. So there is a technical way to fix that with converters, that is, with electronic connections, which finally were installed and those made it possible to work on a local basis. Some of these arrangements that I was talking about, that were prohibited because you had these two big systems that just couldn't be tied together simply. You had to buy an expensive converter. Basin Electric did that in western South Dakota, so they were able to continue the shipments without regard to the cost and the kicks that would occur east and west.

Every time you would have a mini blackout on one side or the other or a bottle, a big loss of generation, why, the lines would break open. I was involved in that from the Denver Office, when we tried to close the line and pretty much knew it wouldn't last. But there was incentive to try and prove it, that we had to do something other than conventional connections. So that is largely a technical question, though it wasn't a great inhibition to doing business. You could just kind of subdivide your activity east and west and make your accounting, until this tie was put in by Basin Electric.

Storey: So was Reclamation all in the western grid?

Reclamation's Grid System

Lloyd: No, we were west and east, both sides. So we had interests on both sides of it and just had to keep our accounting separated in order not to fuzz up the works or assume that you had. There wasn't a physical connection, therefore

there wasn't any means of moving power from west to east until the tie was put in by Basin Electric.

This is similar to the tie that goes from The Dalles in Oregon to Los Angeles. There's one grand hop, that's the D-C tie. That thing can be controlled electronically to ship any amount of power that you want either direction. Whereas normal grid, you're subject to the physics of the system. It's all tied together, one big mesh, and it goes according to the simulation–goes according to the physics of the system and the length of the lines and so forth.

I guess we talked last about running power studies that predicted what would happen under those circumstances. We used to have an analog computer down in Denver. It was a great machine, that we would all hover around and work over days and days and days to set it up. It was three times the size of this room, which is 12-by-20, I guess. It was a huge room full of equipment to simulate what would happen when we made a change in the power transmission system. Of course, today it's done by computer. It was being converted in the seventies. Thank God we got it, because now you can make accurate predictions of what will happen. But, anyway, I'm digressing.

The D-C tie was to make a long-haul connection between L.A., a big market and a source of surplus, theoretically, and Bonneville, which has a big surplus at times of hydro. In order to move that big block of power, you couldn't rely on the A-C [alternating current] system. It just was not the normal power transmission system. You had to put in this tie, and it forces the power to go from A to B or B to A, according to how you set it. That's the flexibility of that type of system. So we installed one of these–I say "we," the public power system–installed one in western South Dakota to effect the same thing on a smaller scale.

Storey: Of course, with us having power in the eastern and western grids, we really wanted connection.

Lloyd: Sure, yes. And you can make sales across that tie, the Bureau could, that you couldn't make before. Of course, when you made them, you owed the owner of that tie something, of course. Then you've got a wheeling charge in effect to get you across the gap, which is only fair.

Storey: Sure. Tell me a little more about this, though. Say we wanted to move our power from the eastern to the western grid, and not only to the western grid but for some reason we had to go a long way into the western grid. My understanding is that in transmission systems you have losses, is that right?

Lloyd: Uh-huh.

Storey: And our power is mixed with other people's power. How do we figure out–we start out with X. How do we figure out what Y is at the other end?

Lloyd: With losses, et al. I mean, that's what your question is–

Storey: Yeah. How does everybody keep track of that?

Lloyd: Well, there's a practical limit. You can't ship all the way across the U-S for the very reason you just prefaced your remarks with; that is, losses will be prohibitive. So you have to rely on simulations that have been run with various scenarios plugged into them. These simulations now done on computer used to be on an analog set of wiring.

You can then calculate what the losses are, but overriding the calculations of a good judgment is a series of circles, let's say, that demark the limits of a system, system A and B and C. And let's say A wants to ship all the way over to C through B. A keeps track of all its loaded generation within its sphere, within its circle. And if it has surplus in A of generation, it's going somewhere else, it's going out. And if it's only connected to B, for simplicity, then it's

going to B.

Storey: Right.

Lloyd: So B owes him something at that instant, but B is in balance except for this surplus that's coming from A. So it's going to be shipping some out too, unless A is connected to C. So that C, being the last in line, is the one that's receiving A's surplus by way of B. So the accounting at the end of the day has to be thorough and complete, but they keep track of it every instant. The tie lines that connect that A to B and B to C, those tie lines are metered extremely carefully, and the accounting of the generation surplus that A had to send to C will come out at the end of the day: "You owe us so many kilowatt hours and here's how." They all agree on that, and it's just an amazing process.

The dispatchers at Watertown, say A, shipping through Pacific Power at Bonneville or some other arrangement, they will all know what that transaction was and be able to account for it. But there will be losses incurred. That doesn't mean that everything that A sent will get to C and those losses will be part of the accounting.

I've done the best I can. Again, you do it–

Storey: So they do figure it out?

Accounting Accuracy

Lloyd: Oh, yeah, they do figure it out because it's big money. These are huge amounts of dollars.

Storey: And they figure it out, I'm hearing, very quickly?

Lloyd: Very quickly.

Storey: And very accurately?

Lloyd: Very accurately, yes, yes. It's not just at C or it drifted, you go pick it off. If you take it, it will be known. It just cannot go–but there are, well, subtle points are, how do you do it efficiently

with the least losses. Losses of 10 percent are not uncommon. That's a lot just to be going up in the atmosphere when you're paying what you do for oil. But here in the West, losses are of about 10 percent, but you have long distances. Back east, they wouldn't afford that sort of stuff. They're burning oil, high-priced fuel. They're loading resources much closer together. They don't have long transmission systems that we do. And I suppose as we become more dense, that is, the load and the generation close together, you have less losses, or you can have less losses economically and probably will have. But we had some long hauls. So they're able to keep track of their transactions and do.

But it's important that each one of these cells, A, B and C, if they're going to be interconnected, like they are in our example, that they maintain very carefully their balance. If A starts to over generate for some reason, let's say they just don't keep track of it, they keep putting more and more water through the turbines, more coal in the boiler, just keep forcing more, they'll start to raise the frequency. Things will start trying to run faster in A, and that forces more power out of A that nobody's calling for, say, "What the hell are you doing?" Well, a signal comes instantaneously from those tie lines that are going out of A back to A's generator–

END SIDE 1, TAPE 1, MARCH 22, 1995.
BEGINNING SIDE 2, TAPE 1, MARCH 22, 1995.

Storey: So, anyway, say A starts over generating.

Problems from Over Generating

Lloyd: For example, if A starts over generating, doesn't control properly, one way that could happen, for example, would be for A to lose a big load. Let's say a great chemical plant drops off and they lose a 500-megawatt load, a huge load. Then A has to start backing down generation right away, either drop the generators, switch them off, or throttle them back. The one way to do that is with the tie line loading frequency control and that tie line that are coupled to the

outside world. Let's say to B, in our example, senses there's a power flow increasing on its tie line, and it will immediately send a signal to the assigned generators to slow down, that is, put in less energy into the system, and it will automatically go back to 60 cycles. As long as the tie line is closed to the other systems, it won't go receptively above. It will be trying to force above 60 cycles. So you have to reduce the energy input to system A to keep things in balance. But that's the key to making the whole system work when you've got connections to the rest of the world.

If you were isolated, if you just had your diesel generator sitting here in a room, you don't care whether it's 59 cycles or 61 cycles, that's close enough. It'll take care and we'll just put a speed governor on. We'll just keep the frequency close enough. That's not good enough with a big system. It has to be fast, instantaneous. Otherwise, these tie lines get overloaded and trip, and then you've got real problems. Then things start falling apart like they have a few times.

In the sixties, the blackout, remember–

Storey: In New York?

Lloyd: In New York. That started a chain reaction throughout the country and we've had several of them in the West. The west power system is more vulnerable, let's say, to disturbances because of its long length, heavy concentrations of generation at one location, big load at the other location. It's tough to keep it all together when there are big disturbances, like a loss of a big transmission line or let's say a nuclear plant shuts down, 1,000 megawatts, maybe 5 percent of the generation. That's a huge event. A lot of engineering and maintenance practices have to be brought to play to make sure nothing worse happens, other than the loss of loss of a little bit of load.

Garrison Diversion Project

I don't know if this is historically valuable to you, Brit, but it was a great day for the Bureau when I left the Bureau with some concern over being away from all that. But then again, I guess the thought of being in the water business was rather interesting. I think I said before, I got a baptism in the politics of water projects on the Garrison Diversion Project, which was one where you take water from the Missouri [River] and ship it into the eastern part of North Dakota. And the return flows would flow into Canada; part of the water that we divert would flow into Canada. While I worked for over a year with the Canadians, through the sponsorship of the International Joint Commission. The I-J-C, deals in technical problems between Canada and the U.S., having to do with water quantity and water quality. Well, this one was a water quality issue, primarily.

The environmental community wanted no part of Garrison. And they found out they had a corresponding community up in Canada that didn't want it either, which kicked off the controversy. We were then asked–"we," that is, the U.S. and Canada assigned a team to look at the ramifications of and what really happened if Garrison Diversion were to be built as planned. So that's where I really got involved in the water business. And I can't say that one turned out so very successfully for the Garrison Diversion Project, because there were so many unknowns about the effect of these foreign waters on the Canadian waters that we couldn't prove that it wouldn't happen. And that was enough to give us a lot of slowdown in the project, from a political standpoint.

The project was in deep trouble to begin with, domestically, because of its cost and partially because of–well, there was great support and still is, in North Dakota, for the project. In other words, North Dakota said, "Look, Army Corps of Engineers, you built these vast dams, you flooded all our bottom lands, you've protected downstream Omaha, you've given navigation. Now where's ours?"

"Well, you got some power."

"Well, that's not good enough. We want irrigated land." And they had a point. And politically they had a point. And people tried hard to bring a piece of the Garrison Project on that was responsible. They didn't blame the Canadians, and I think they have, finally, but I don't know what's happened to it. But they brought out pieces of it that were in the American drainage, the U.S. drainage. So they didn't have any Canadian problems.

One of the main re-regulating reservoirs, deemed a main re-regulating reservoir, was right on the Divide. The Continental Divide in North Dakota is a rise in the horizon. You can't see it, but anyway, its location was such that it would've drained into Canada or back in the U.S. And I don't think they've ever let any water go to Canada out of that reservoir, because they're concerned they were going to get new bugs, they were going to get new minerals.

Storey: New organisms.

Lloyd: New organisms.

Storey: Yeah, they're still concerned about that.

Lloyd: Foreign biota.

Storey: That's right. When was this year that you spent on the I-J-C, working with it?

Lloyd: I-J-C. We worked on it in '79, I think it was, about 1979. If I have the opportunity, you know, maybe some of these dates I can confirm. If you'll show me the dates sometime, I promise to go through my things and get the dates right.

Storey: Well, you'll get a copy of the transcript.

Lloyd: Yeah, yeah, that's fine.

Storey: By that time, the transmission facilities and the marketing function for electricity had been

transferred to the Western Area Power Administration. I don't remember whether we talked about that last time.

Transfer of Power Marketing to WAPA

Lloyd: That's right. That's right. So I was busy in that activity. Then the power went to Western and I stayed with the Bureau.

Storey: Why did you stay with the Bureau?

Lloyd: Well, I guess that's what I'm saying, the water business, I got involved in the water business on the Garrison Project. And I had the feeling; I got caught up in the importance of the Bureau building things that were important to the local folks. The power system was interesting from a management standpoint and all those coordination problems with the other power entities. But I guess the thought of building a new project was kind of fascinating. Garrison looked like it wasn't going anywhere. But I said, "Well, I'll stick with the Bureau and see what comes up." Then I finally came over to this region and thought we were still building a few things, and we were.

Storey: Had you made a career decision in there?

Lloyd: Yes.

Storey: Career planning, had you done some career planning that changed the way you were going or something?

Lloyd: You know, I guess I did. I thought, and rightfully, and I'm trying hard to get what the sequence was. If I had went with Western Area Power Administration, I could've had probably a pretty good job there; I expected and was offered. But then I thought, gee, if I become a Regional Director in the Bureau, I can have a pretty good arrangement and stay here in Billings.

So, yeah, it was a struggle between doing something I was very familiar with and liked. I

liked the people that were in the power business, Bob McPhail and Tom Weaver and Jim Davies, the whole group, I worked with very well. It was largely the people from the Missouri Basin that ran Western, plus one or two from Bonneville. But I said, "Gee, I could be my own boss, more or less, more so [than] there." So there were two things. One, I liked the water business, I guess. And the second one was I could be more free. And it probably turned out that way, too. I mean, I grant, if you're going to do administration, gee, there's an administrator, that's Bob, that's the guy I used to work for, close by. And I would be a super honcho. Layer-wise, I would be closer to the top, but in reality, I know what's what. To be a Regional Director for the Bureau seemed to me to be a pretty good deal, and that was a strong prospect.

Storey: So you had your goal set at that time?

Setting Career Goals

Lloyd: Must have. I haven't really thought that, but I know that at the time it was part of it. There was the comfort of being there. We liked Billings. It's a great town. I like the outdoors and what was there.

But the frustrations, finally, though, the Garrison Project and all lock-in that region, lock-in on any future irrigation business, was just kind of miserable. So then I guess my reason to then want to come out or move on to Northwest was that things were happening here in the area, arena that I chose to stay in. So I hadn't been disappointed, that was a good thing.

Storey: At the point that WAPA was created, that was '77, I believe, might have been '76, how far were you away from the Regional Director's slot?

Lloyd: I was Assistant.

Storey: You were an Assistant Regional Director at that point. What grade would that have been?

Lloyd: Fifteen.

Storey: A fifteen. And you were in charge of what?

Lloyd: The assistant was just that. He was not specifically in charge of any–

Storey: Oh, there was just one?

Lloyd: Yeah.

Storey: Oh, okay.

Lloyd: Yeah. I guess there was an assistant to the Regional Director for administration. But as far as the other functions are concerned, there was just one.

Storey: When did you become the Assistant Regional Director?

Lloyd: I guess two years before I left, about '78.

Storey: Okay. Now, wait, I'm getting confused. I thought we were talking about in '77 what position you had.

Lloyd: Well–

Storey: Or '76.

Lloyd: Oh, in '76, I was in power function, I'm sure.

Storey: And you were the head of the power function?

Responsibilities as Head of the Region Power Function

Lloyd: Yeah.

Storey: So, okay, about how many folks would you have been supervising to run all of–I hear a bookkeeping function, I hear an actual O&M function for–

Lloyd: Power.

Storey: Power. You know, taking care of the transmission lines. I hear people at a control

center or more than one control center, controlling the system. I hear people who have to go out and talk to the power company, the other power groups and so on. How many folks were involved in your power group, and how were these different things I see as necessary taken care of?

Lloyd: Well, remember that we had project managers through all this, too. So what your reach is depends on how wide you're talking about, under direct supervision or technical supervision. Let's say the power function in the region, in total, everything from line man to the regional supervisor of power, which I was, probably 240 people. Now, they didn't all report to me by any means. Many of them reported to their area supervisor or project superintendent.

But the Regional Supervisor of Power, that was the job I had, had the technical supervision and the exact supervision of his office staff, which was probably about twenty-five people that were right there, that you could look at. In the three divisions, you picked them up quickly. There was the O&M, and there's the engineering, that is the new installations, and then there was the marketing. Those were the three functions that we broke it down into and had a thirteen in charge of those three functions. And they really called the shots, what was to be done.

But to carry it out and–oh, excuse me, and then there was the Operation Center, and then they didn't report to the Regional Director directly. That job reported to the Regional Director as an area office would. But technically, again, it came to the Regional Supervisor of Power who coordinated that fourth function, which was the day-by-day operations. So where am I rambling off to? You were asking how many people.

Storey: How many people and how you took care of all these different functions that were needed and so on.

Lloyd: Yeah. So the Regional Office, the Regional Supervisor of Power kept track and did the liaison with outside agencies, other than the day-by-day operations, mind you. The day-by-day transactions we talked about before, that was the Watertown Office, the dispatcher's office. But any long-term activity, accounting was taken care of by the Regional Office. I don't know if that's helping you at all.

Storey: We had all these monies coming in from wheeling charges, from power sales and so on. Who handled all of the money?

Lloyd: Well, of course, you had a Bureau Regional Finance Officer, who was the grand honcho in charge of making sure that it was received in the right pots. They sent their checks to–that's an interesting question–but I think they did right to the Bureau, right to the Billings Office for a while, until electronic deposits–

Storey: Transfers, yeah.

Lloyd: –transfers became the mode, yeah. So we had lots of help. It isn't to say with the 220 and all, there wasn't any support. There was plenty support not only from a civil engineering standpoint, a water operation standpoint. There was, gee, powerplant operations. For example, we had two big power plants, Yellowtail and Canyon Ferry [dams] that we had to staff and operate. But we had the finance support and the officers, the whole works. The usual Bureau support that you got as a result of a big operation. It would have to be a lot bigger than 240 people if we didn't have the support offered by the other divisions.

Storey: So, for instance, your office was in charge of the O&M of the generation and the transmission systems?

Lloyd: In a technical sense, but then again, you had area or project managers, powerplant managers who had the direct supervision of the people that carried out and did the work; did 90 percent of it without coaching. It was scheduled things that

they did. It was a normal course of affairs.

But the budgeting, for example, the setting of the budget and the setting of the people's ceilings and so forth, was always done through the Regional Office. I guess you'd say the Regional Office was certainly in technical charge. There wasn't any confusion about that. If they wanted something new or more people or to do something out of the ordinary, they certainly had to bring it up to the Regional Office. Or the Regional Office, on the other hand, we've got to have the job of making sure that it was a new safety requirement or whatever, that it was passed on and carried out at the project level. So we had the job of setting the standards and checking up and doing the safety reviews and the operational reviews.

Of course, we were all subject to Denver review, on the other hand. They'd always come down and see that you're doing things right and things weren't falling apart. You were protecting the public, the people who worked on the job, and the equipment, for the long haul. They had lots of support, when you think about it, layer upon layer. It's probably well that it's set up that way, but it's expensive.

Storey: What kind of O&M do you have to do for a transmission line?

Maintaining Transmission Systems

Lloyd: Well, keep people from building under it, for one thing. That was one of the public issues that would occur from time to time. When the easement was taken, that's the right term, there was the condition that you not encroach on the transmission function. So that you shouldn't be building buildings underneath. They did. They built small ones, the owners, the people that retained the land, but the easement require they not interfere with it. That was one of the issues.

The other thing from a real maintenance standpoint, there wasn't an awful lot that you had to do except replace insulators and

obviously broken pieces of structure. Of course, in the case of a wood pole, and we had a few of those, quite a few of them, in fact, 115 k-V and below, wood pole, that was our standard. And those had to be carefully monitored for rot and protected if it set in or replaced if it was beyond. But we didn't have too much of it at that time, except the old Fort Peck.[13] Fort Peck came very early in the history of that region. Fort Peck line had problems and had to have poles replaced and so forth, wood poles. But with the steel towers, they're very reliable, people don't shoot at them and ice doesn't get them. Occasionally ice took out several miles of transmission line with about eight-inch buildup, total diameter, not radial.

In the Yellowtail vicinity, one year, you have to do line patrol. You have to go out and see what you have before it fails. This is preventive maintenance now. This is not that you go out and see what's falling apart, if you can tell from the air, with a helicopter you can do a pretty good job. And steel towers, not a heck of a lot. They're really a work of good engineering, I would say, for the most part, until you get bad storms, that's the killer. And hunters, sometimes, in some locations, knock the skirts off the insulators. It's seldom that they can shoot one down, but that's happened on occasion.

In one case there was a funny picture that Leo Deguire, I don't know if you've ever met Leo or heard about him, he was the Project Manager down in Montrose. Leo had two little Indian kids by the hands, not roughly, but he's a huge man, and he had them by the hands, and these were the perpetrators of a loss of a big transmission line, a 345 [kV] line. The kids were part of a sheep herding family and they unscrewed the turn buckles. These were gage towers. They have four guide lines that go out

13. Construction of Fort Peck Dam began in 1933 by the Corps of Engineers and completed in 1940, and was the first dam on the Missouri River. For more information, see US Army Corps of Engineers, Omaha District, "Fort Peck Dam & Lake," http://www.nwo.usace.army.mil/Missions/Dam-and-Lake-Projects/Missouri-River-Dams/Fort-Peck/ (Accessed December 2016).

in both directions, rather than the self-supporting tower. The little kids unscrewed the turn buckles because they thought that was something fun to do, and then the wind came up and the line went, [down] effectively.

Storey: Oh, my.

Lloyd: But there was Leo, I can picture, with those kids, I can remember to this day. We found the problem.

Storey: And convinced them not to do it again, hopefully.

Lloyd: I think they welded all the turn buckles. Simple solution. They just never thought "who the hell would to do that."

Storey: What about O&M in powerplants?

Powerplant O&M

Lloyd: That's a routine, that's like your automobile. You get 100–10,000 hours, excuse me, when you get about five years then you have to start doing various levels of things, everything from bearings to winding replacement. The biggest thing you do in a powerplant for the generators themselves is probably a rewinding. The windings, over time, with slight movement, thermal and vibrational, lose their integrity, and you have to take the damn things out and plug in a new bunch. They've been able to do that and upgrade many of the generators. That is, if they got more hydraulic horsepower they can get more electric out with modern insulation. That's what they're doing today. That's a major operation, to pull a whole generator down.

Probably the turbine side gets more attention, depending on how reliable it is, with cavitation problems and so forth. If there's cavitation, then the erosion of the metal is such that about every three or four years you take it, open it up, get in there and weld in spots, build back up where the wear has gotten excessive, try not to take it out if you don't have to, of course,

but do it in place.

So turbines and the generators, the power transformers, the lines, the lightening arresters, all the rest of the gear are similar to the rest of the system, but the rotating machinery is the thing in the powerplant that takes a lot of attention and time. I don't know how they do it today. We had practically all the crews at the plants that I was familiar with, had capability to do this sort of thing at the time I was there. Now they may contract it out for somebody to come so that you've got local people just to watch over more. They don't have to tear down major equipment. They just have to keep track of things and operate it.

That's kind of the way things are going these dayS. You remotely operate. That's even a step beyond what I just mentioned. You have a custodial type of operator that sits there and takes care of things if there's a problem. But today, they operate them remotely and bring in a crew during work hours, during your eight-hour shift, to see what's going on and schedule some down time later on to do these major things, and that crew may be from outside the project, may be in Grand Coulee, for example, or he may be a contractor.

Powerplants were–and Grand Coulee, of course, is an example of an industrial city. Their equipment up there is vast. They can construct practically anything that they have. They don't have a foundry, I don't believe, but just short of that, why, they've got all the capability of rebuilding a vast number of machines they've got. They have eighteen–I would guess on the order of thirty-five large generators, plus then the Third Powerplant which has six super large, and that's a city in and of itself. So lots of business in Grand Coulee. And they have enough capability so they could be a contractor for the Bureau sort of thing. I think that's what they're doing now. I've got to ask John sometime.

Grand Coulee would pick up its road crew

and go out to Hungry Horse[14] [Dam] and do the work there, rather than duplicate these talents which we pay for. The classification of the plant people, it depends on their ability to do these things. There's staff at each and every plant, expensive. I know we struggle about contractor versus internal. My attitude was if you're going to staff and maintain these people, let's do it ourselves. If we want to contract it out, we're going to change the organization to reflect that in the long pull. It's probably a good idea for a least cost.

Storey: Tell me what happened to your office, the power office in Billings, when the Western Area Power Administration was created. What effects did that have on it?

Western Area Power Administration

Lloyd: Well, the good folks that all worked there went to Denver, those that wanted to. We retained a very small core of three or four people at the Billings Office for powerplant, and contact with Western was rather limited. We had contracts that were specific to Bureau projects that we had to maintain, power contracts, that were part of the Bureau's business, the water business, pumping power, that sort of thing. So it reduced to just a few people.

Storey: To just a few people?

Lloyd: Yeah. Two, maybe three people.

Storey: From twenty-five?

Lloyd: Yeah.

Storey: So it was a pretty substantial change?

14. Hungry Horse Dam is the primary feature of the Hungry Horse Project in Flathead County, Montana. The dam "is on the South Fork of the Flathead River, 15 miles south of the west entrance to Glacier National Park and 20 miles northeast of Kalispell, Mont. ... The project plays an important role in the program for meeting the growing need for power in the Pacific Northwest and in plans for providing a storage system for control of devastating floods. It also contributes to irrigation, navigation, and other uses." For more information, see "Hungry Horse Project," in *Project Data*, 535-540.

Lloyd: A big change, yes, yes, yes, for the Regional Office. Of course, all the area offices stayed put and went to Denver for their support. And, of course, they established an area office there in Billings, a separate building.

Storey: WAPA did?

Lloyd: WAPA did.

Storey: And did a lot of people go over there?

Lloyd: Yes, yes. Some went to Denver and some went over there, I'm sorry. They didn't all go to Denver. Denver's the central collection.

Storey: Bob McPhail went over there.

Lloyd: Bob went to Denver, right.

Storey: Oh, he went to Denver as the administrator?

Lloyd: Uh-huh.

Storey: What was he like as a Regional Director?

Bob McPhail

Lloyd: Interesting guy and good. He spoke his mind. He was very politically astute, smart. Of course, not trusted, at first, because he came from Interior, and he was going to be the black hat that was going to raise hell with all our good works out here. But Bob was not that way. He just wanted to catch up with what was going on and be in charge, which he was, thoroughly. He was a good guy. The big test, of course, in this whole game of natural resources and serving them up to the public, is how well did he get along with the constituency, what do they think about what you're doing. And McPhail was greatly supported in the long pull. He did a lot for them.

Storey: When you say the constituency, you're talking the staff or you're talking Reclamation's customers?

Lloyd: Customers, the staff, too. The staff certainly saw that, saw that he was a fair guy. He was at a different pace. He wasn't the old Bureau stiff, let's put it this way. He did not come up from either the design ranks or construction or Denver or wherever else. I think he may have worked on some small task for the Bureau, but mainly in the Washington Office, I think that was his background. Yeah. He worked in the Secretary's Office, for Jim Smith, I guess, spotted him. I think he came from Interior ranks. Whatever the case, he didn't have the traditional background in the E&R Center or construction business or regional business. I guess that was the reason, at first, people wondered what's this guy going to do. It worked out very well. He was quick to pick up with the clients out there.

END SIDE 2, TAPE 1. MARCH 22, 1995.
BEGIN SIDE 1, TAPE 2. MARCH 22, 1995.

Storey: This is tape two of an interview by Brit Storey with Lester W. Lloyd on March 22, 1995. Who succeeded Bob McPhail?

Lloyd: I did. As Regional Director?

Storey: Yes.

Lloyd: In Billings, yes, I did.

Storey: Didn't he leave in '76 or '77 to go to Western Area? I'm getting a little confused about when you became the Assistant Regional Director.

Lloyd: Well, I was Assistant under Bob. See, I guess I had two years of–'78 to '80 as Regional Director in Billings, and Bob was–Brit, I can't put it all together. They ran close by, but when Bob left, there was nobody else that came in, I'm certain of that. And I may have been acting for–

Storey: Him as the Assistant Regional Director.

Lloyd: Yes.

Storey: So by that time you'd been promoted to the

Assistant Regional Director's position.

Lloyd: Yeah, oh, yeah.

Becoming Assistant Regional Director

Storey: Tell me how that came about, do you remember?

Lloyd: Let's see, I guess the assistant when Bob came, retired. Yeah, yeah. Then Bob was looking for a new assistant. There were about three or four of us that put our names in. I didn't even think about it at that time, I must say, from career planning. I was pretty satisfied in the power thing, and he said, "Well, you ought to put in for it." So, I did and I was selected. So Bob selected me for Assistant Regional Director, soon after Bob came, within six months.

And then for a large part of that time, I guess I was Assistant Regional Director when I went to this study that took well over a year, the I-J-C study. Then that was over and then Bob left and there might have been a gap of a short while and I was selected as Regional Director.

Storey: Who selected you?

Lloyd: Was it Gil–it was Gil Stamm. When did he leave?

Storey: Well, allow me to get my crib sheet. Gil Stamm left in '77, Keith Higginson was Commissioner '77 to '81.

Lloyd: Okay. I said Gil. No, Gil talked to me. Gil put Bob in Billings. It had to be Keith. It had to be Keith.

Storey: Of course, in addition to WAPA being created in the late seventies, there was another major event in Reclamation's history, and that was the failure of Teton [Dam].

Reaction to Teton Dam Failure

Lloyd: Yes.

Storey: Do you remember where you were and how people at Reclamation reacted to that?

Lloyd: I think I was–I know I was, I was on that I-J-C study. Tell me the date again. '77?

Storey: I believe it was '76 when it occurred.

Lloyd: I know Bob was there and Bob sent people over, of course. The reaction, the immediate reaction, was disbelief this doesn't happen. That soon got behind and a call came for help. I know Alice Norman, our head secretary at the office, very capable gal, she went over there and several others from our office to help out the Recovery Office. I've forgotten what help we offered. But, you know, there was shock and dismay. I mean, this was unbelievable. But I guess I was either traveling on the I-J-C study. I don't remember where I was like I did when [John F.] Kennedy was shot. I know where I was when that–

Storey: Now, let's see, are you saying I-J, like in Joint?

Lloyd: Yes.

Storey: C–

Lloyd: Yes, I-J-C, I-J-C.

Storey: Commission. International Joint Commission. Okay. I've been mishearing you all along. Okay. So when you became Regional Director, what were the major issues that you had to deal with in Billings?

Major Issues in Billings

Lloyd: Oh, golly, the Garrison, the disposition of the Garrison Diversion Project and whether to keep that staff up there. What the budget was going to be, whether we could go forward or not, whether it was wise to, whether we could get released from the clutches of the resolution of the design of the project. That was a major issue. We were downsizing, downsized on the power, that was a fact accomplished by the time

that I became Regional Director.

We had the continuation of the drainage project down at Riverton, trying to wrap it up and get that done. The usual staffing problems. I mean, who to find to do the various jobs. We were trying to get going on Polecat Bench, that was a 20,000-acre project that was an extension of the Riverton Project[15] from the same drainage from the Wind River, trying to get something going there in the way of planning. Set up a small office to do that, didn't make it.

Funny that the agricultural people started to worry pretty much about competition after a while, too, you know. They said, "Well, geez, more of this isn't necessarily good for us. It may be good for the new ones or somebody else, or unless we own the land. Well, what the hell do we need it for to add to our crop surplus?" So we ran into a little bit of that early on, especially there in Wyoming.

Constant preoccupation with the water supply for the coal fields. That was something we thought we could help in, but I think we already had the North Central Power Study problems, political problems. There were no groundswell for our new water supply. In fact, the state of Montana had carefully reserved a great deal of the Yellowstone River for in-stream flows to preempt any further development, industrial or otherwise. No threat of additional agricultural development along the Yellowstone, but they certainly didn't want it taken out for coal or go wherever to burn in place and elsewhere. At least that was the message that was sent out.

Storey: This was for the coal slurries?

15. "The Riverton Unit is located in central Wyoming in Fremont County of the ceded portion of the Wind River Indian Reservation. The unit lands lie in the Wind River Basin and to the north of the river." Project features include Bull Lake Dam, Pilot Butte Dam, Wind River Diversion Dam and Pilot Butte Powerplant and provides irrigation service to 59,713 acres. For more information, see "Pick-Sloan Missouri Basin Program Riverton Unit," in *Project Data*, 983-990.

Lloyd: Yeah, the coal slurry and other. Very unpopular concept to ship our water down there.

Storey: To Louisiana or someplace.

Montana and Coal Development

Lloyd: It turned out that the amount of water used wasn't any greater then would've been used in a powerplant right there that evaporates the water, evaporative use of the water. They certainly didn't want the plant being cooled by the river itself. That raises the temperature of the river in the summertime to bad levels if it's a big plant. But Montana Power did finally get enough water from the Yellowstone to supplement what it had out at the coal fields so they can run their modest size, maybe 1,500 or 2,000 megawatts of generation, but they used Yellowstone water. But that's not 50,000 megawatts, that's not some federal plant. They worked very hard to get what they did.

So those things were happening, those changes were occurring in Montana. Montana was coming from a kind of a slow agricultural not-much-going-on community, to one that was really actively opposed to coal development, which was just a constant theme throughout that part of Montana and the whole state in the middle to late seventies. The drumbeat for more coal. Montana and the legislature succeeded in getting an excise or a tax, extraction tax, on coal, huge, something like a third of the cost of the coal, which was very, very good for those contracts that were up and going, but it killed a lot of business. It killed it or at least it held it off. It was enough to make it unattractive with all the shipping costs and everything else to ship coal out east. So Montana never did realize the boom that it was afraid was coming. It may happen some day. They've got a hell of a tax in place and they're ready for it.

But they wanted to be sure they didn't have communities that were underfunded for schools and sewage and all that stuff. So, gosh, a lot of that money, by the way, that tax, was earmarked

specifically for impacts associated with the coal: schools, sewage and roads and all the works. So it wasn't going into the general fund necessarily. I don't know what they're doing know. I bet they've tapped it. I bet they have, because there's so damn much of it, they weren't able to spend it locally, or whatever. It's like Alaska, you know, they got their millions, billions from the oil. They just spread it back to the folks, I guess. Don't you get an annual payment up there?

Storey: I think you do, yeah.

Lloyd: I think so. Well, that was the main theme. From a Bureau standpoint, I guess we had continued concern about the Garrison with the Canadians, but that was pretty much laid to rest. We'd work on our side of the Divide, which was still a reasonable project, mind you. That could've gone. But there was so much opposition, I think, from other than North Dakota. The North Dakota delegation was very strong in favor or it, but they couldn't get much money flowing. So the Bismarck Office was always in a state of flux. They wanted to do a little bit of work, but they didn't have the people. Then they had the people and not enough work. So they were up and down and back and forth on the Garrison.

Oahe Project

And the Oahe Project,[16] I didn't mention that one. The Oahe Project was the sister project in South Dakota, corresponding to the Garrison, was all U-S-A drainage, no foreign problems. But there there was a grass-roots movement from family farmers that made it look to most people that observed, that South Dakota really didn't want this project. By God, they didn't want to upset the status of things, it was a big waste of money. The pumping plant was built,

16. Reclamation planned the Oahe Unit as "a multipurpose project ... for the irrigation of 190,000 in the north-central part of the eastern half of South Dakota." The unit would also include "municipal and industrial water supplies, fish and wildlife conservation and development, water-based recreation, and flood control. For more information, see "Pick-Sloan Missouri Basin Program Oahe Unit (Initial Stage)," in *Project Data*, 953-958.

the Oahe Pumping Plant to move the water up and then on east, and part of the canal was built. I'm not sure whether it's de-authorized now or not. You may know. I think it is.

Storey: I don't know.

Lloyd: It got stopped off. They took some salvage part of it, but the Oahe Project–so we had the Garrison, the Oahe, which were in terrible shape, and the other projects weren't coming along, and power had gone. And you'd say, "Why did you stick with the Bureau?" I guess I answered that already. There was an opportunity to be a Regional Director, and I was pretty close to it and that's why I stuck with it. Then I moved down over here where there was a little more water business.

Storey: Tell me more about Garrison, though. It's a big, big project, and it never seems to get quite off the ground.

Garrison Project Never Got Off the Ground

Lloyd: That's right.

Storey: What was going on?

Lloyd: Well, it was a quarter-million-acre project. That is huge. And they started at the beginning, naturally, they started at the dam, or the reservoir–what is it, Lake Sakakawea? Behind Garrison Dam.[17] And built a huge pumping plant that's in place, and started building the canal. The canal was huge. It must of had been 2,500 cubic feet a second. It's a big one.

Anyway, they were headed for Lonetree Reservoir. Lonetree Reservoir site was all purchased, ready to go, but I can't tell you whether water's been delivered or not. There hadn't been at the time I was there. One of the features along that canal was to be a very fine mesh screen to keep all those critters out that

17. Constructed in 1953 by the Corps of Engineers, Garrison Dam is an earthfilled embankment dam on the Missouri River in central North Dakota.

would go on to Canada. But that wasn't good enough. "That damn screen won't work. You know it won't work. There will be a hole punched in that and we'll all perish." So that was the technical issue having to do with the fish screen. But that was built into the design of the thing.

So money kept going toward it, but never really got cleared through all the environmental concerns such that heavy funding occurred. But then came along the big blow, was the Canadian concerns. So that part of the project that was in the Canadian drainage, I think it was more than half, it really got pushed way back because of those concerns. But left–there's some drainage down on the James River which headed to South Dakota. It peels off and goes south before it goes on to the Canadian drainage. That part could be supplied by local water for a test purpose, but ultimately augmented by Garrison Diversion water, a huge feature over there, pumping that canal to feed a damn small project. That, as I recall, finally came to bear.

The problems were that it wasn't economic, it was going to hurt the environment. North Dakota didn't say this. These were outsiders or Canadians having to do with Garrison. There was very good support locally, for the most part, but even there in North Dakota, after the success done on the Oahe, some of the people who opposed big irrigation projects came north to Garrison and started a grassroots movement that added to the problems, if not with the local delegation, at lease with the rest.

So, you know, you'd think with a project of that magnitude and cost that there'd be a very strong, vocal group in favor, and there were, and that was the Garrison Diversion, what did they call themselves, the conservancy district. They formed a conservancy district, and those people were very strong politically and they were the sole voice for a long time, and boosters. They didn't have any opposition. But then there were opposition groups in North Dakota and certainly nationally, the Audubon Society. The Audubon

Society did a lot of campaigning, lobbying against Garrison and Oahe, both, really laid it out and made it such that it was easier to vote against it or not get appropriations for it, not get it cleared.

So, really, I guess people were starting to look for reasons not to spend money about that time on water projects, too. They were caught up in a national movement, certainly. And they were on a hit list, both of them.

Storey: The Carter hit list.[18]

Carter "hit list"

Lloyd: Yeah. And never got off after that time. Well, gee, they were in trouble when, early seventies, early seventies, they both had opposition growing. But the South Dakota thing was unique in that it was allegedly a grass-roots farmer movement that said, "We don't want irrigation done here. We're getting along fine." And it's true that they aren't the dry land that we are here. They get maybe seventeen inches of rainfall annually. They grow a pretty good crop a lot of years. They don't have quite the call for it. They do okay. And I think that, coupled with big government and somebody taking their land, that was the big issue. Taking their land for the canal, boy, they just whipped the hell out of things. Remember, it was all private land. There wasn't a lot reserved for B-L-M [Bureau of Land Management]. You just took it for Reclamation purposes. You didn't go out and acquire all this land. That created tremendous

18. Jimmy Carter served as President of the United States from 1977 until 1981 after his election in 1976. Within a few weeks of the beginning of the Administration, an internal discussion document accidently fell into the hands of a reporter. The document proposed cancellation of a number of water projects considered environmentally or economically unsound. This proposal came to be known as Jimmy Carter's "hit list." This happened while Commissioner Daniel P. Beard worked in the Carter Administration, and he discussed his perspective on the issue in his Reclamation oral history interviews and in "The Passage of the Central Valley Project Improvement Act, 1991-1992: The Role of George Miller," an Oral History interview by Malca Chall, 1996 for the Regional Oral History Office, Bancroft Library, University of California.

stirs. And you couldn't relocate that canal just anywhere.

Storey: No.

Lloyd: You had to take a natural course. Man, they worked that to the death. And that's true also up at Garrison to some degree, too. I guess the acquisition of the reservoir site, the whole works. You'll always find two or three landowners that are ready to make the papers, raise hell about "busting my operation up."

They didn't have any neighbors. That's the other thing, too, I guess. I just got through saying that in Wyoming you tried to bring a new project on and people would say, "We don't need the competition," but on the other hand they could see the success of irrigation in their area. I mean, they know it works. It can be made to work. You have to do certain things.

But North and South Dakota, especially the eastern part, that was pushing the frontiers, still is, for the reasons that the rainfall is there. They have an agricultural base that's fairly successful without it. So when you get that far into the wet zone, I guess, oversimplification, but it certainly did add to it.

Storey: Tell me about your move to Boise. How did that come about?

Move to Boise

Lloyd: Well, Rod Vissia[19] left to go to Denver to run the E&R Center, so there was a vacancy. I got talking to Keith about the frustration of the Oahes, the Garrisons, the water projects I liked but I couldn't get to. We talked about Boise and he said, "Why don't you move there?" So I

19. Rodney (Rod) J. Vissia was Pacific Northwest Regional Director from 1974 to 1980, before becoming Assistant Commissioner Engineering and Research, 1980-1982. Mr. Vissia also participated in Reclamation's oral history program. See Rodney (Rod) J. Vissia, *Oral History Interviews*, Transcript of tape-recorded Bureau of Reclamation oral history interviews conducted by Brit Allan Storey, senior historian, Bureau of Reclamation, in Ocean Shores, Washington, edited by Brit Allan Storey, 2011, www.usbr.gov/history/oralhist.html.

said, "Okay."

Storey: So this was something Keith Higginson chose you for?

Lloyd: Uh-huh.

Storey: Did you like it better?

Lloyd: Yeah. Yeah. This had a much stronger sense of order, I don't mean from the Bureau standpoint, I mean from the public standpoint, about water distance. Water is a deadly serious necessity for Idaho. Not for eastern North and South Dakota; that's what I just got through talking about. Over here in Idaho, the first thing they want to know is, "You're from Montana, well, maybe you're okay." This is the water users. "We don't want anybody from California." Do you know why they don't want anybody from California, even in the Bureau? "Because they're going to take our water." That's how serious they are. Maybe ill-advised. I got a kick out of that one. You're from Montana, no wrong attitudes up there.

Yeah, I was deeply impressed with the businesslike approach to water in the Columbia [River] Basin, Yakima, here in Idaho, throughout Idaho. Complications of shortage of water supply in Yakima [River basin] brought to bear all the water wizards from the Indians to the state to the Bureau. It wasn't a crying need, but it was a need to get a more secure water base. I'm not sure it's even been accomplished, but there was a lot of planning activity going on.

Challenges in the Pacific Northwest Region

Especially in light of the fish impacts, I think that was the new factor that go thrown in the pot that made it very interesting. That is, the protection of the fish and making sure that we didn't get shut down or that the Bureau operations weren't shut down as a result of, or negatively impacted. It was all the fishery requirements that were impossible. So we did a lot of work to improve what we could, flows for

the fish, but more importantly, I think, was screening of the canals to prevent loss of small fish in irrigation canals, making irrigation projects very successful on the Yakima Project.[20]

Remember, that was my first–well, Idaho and Washington both have very high-value crops compared to Montana and Wyoming. Geez, I mean, you grow alfalfa a little bit, a couple of crops a year, and maybe some sugar beets, if you're really fortunate. But hay crops, farm economy just isn't strong on an irrigated base in those states. It is in the states, I'm talking about where you've got orchards that are at the top of the thing. You've got a twenty-five-acre orchard, that's a family business. You've got water for that, you're in fat city. Maybe a little more water for frost control, even better. Maybe a pressurized system, that's a lot of the work that we got into. The engineering of the pressurized water systems for the orchardists, that worked out pretty well. Yakima as well as the Oroville Tonasket Project up on the Canadian border.

And the power business, of course, if you like power generation, Grand Coulee is a shrine of generation and had an interesting industrial complex up there that was a constant source of interest and challenge; tough labor problems. I was told the other day by a Bureau person that they're in court now over their reorganization. The reorganization, I think, makes up work crews that don't have craft-specific alignment of duties. See, at Grand Coulee they had at one time, gee, maybe seven or eight trades, craft unions that carefully controlled their fiefdoms, and if you wanted to take a bolt off, that was a mechanic's job. If you want to move a wire, that's an electrician's job. If you want to raise a

20. Construction of the first units of the Yakima Project began in 1906. "The Yakima Project provides irrigation water for a comparatively narrow strip of fertile land that extends for 175 miles on both sides of the Yakima River in south-central Washington. The irrigable lands presently being served total approximately 464,000 acres. ... There are seven divisions in the project: Storage, Kititas, Tieton, Sunnyside, Roza, Kennewick, and Wapato." For more information, See "Yakima Project," in *Project Data*, 1337-1356.

roller, that's a rigger's job. And God, all that work had to be segregated down so that each of these crews were brought in to do these functions, and it got kind of silly in a degree, I guess, that they segregated it. But it projected jobs and was important to these people, and I think now has been organized such that some of that's going to be gotten around. But that was a labor problem, I must say, we didn't make many inroads in, but it was one we certainly tried to approach to see if we couldn't lessen the overhead.

Storey: As Regional Director, what kind of contact did you have with the unions? What kind of skills did you have to have with dealing with the unions?

Lloyd: I must say I didn't have much at all. The Project Manager's job was to deal with them. Of course, we had a personnel assistant whose full job was just that, was union and relationship with those organizations. I guess the relationship was one of trying to support, in any way I could, the Project Manager's redesign of the system to make it efficient to get the job done. Unions were just much stronger in Grand Coulee. It was large enough to support so many of them, it became a problem, in my opinion.

Let's see. I guess I mentioned the anadromous fish in the Yakima [River], and that subsequently spread to the whole region. That's no longer just the Yakima, it's the whole Columbian Basin because of the concern over the salmon.

Rebuilding Teton

I mentioned the power. Irrigation development was still going on. Rebuilding of Teton was an interesting sidelight. The supporters of Teton still want to see it rebuilt. I think they've finally given up on federal money, or at least federal initiative of doing it. But, of course, it was well over by the time I arrived here. But that didn't mean they weren't still quite active, wanting to get the dam

reconstructed, get all those benefits.

Storey: How were they trying to put pressure on you, on Reclamation?

Lloyd: Oh, they'd say, "Look, Reclamation, we have a contract with you, a repayment contract with you, and that means you're going to deliver us a system. Where is it?"

"Well, we have problems. It isn't there any longer, and we don't have anybody to rebuild it. We could, mind you. We know how to do it safely this time. We've got a couple of designs. We could do it safely, but we have to convince some pretty important people, starting with the Commissioner and Interior Secretary and a whole host of others that are even more important, probably, and funding," and so it goes.

I must say that Teton was never a barn-burner anyway, as a benefit-cost and a need situation. There was supplemental water. They do fairly well up there in that short growing season, growing seed potatoes and whatever. It isn't all that crucial, I don't think, to their existence. But as I say, its benefit-cost wasn't very good to begin with, and now if you get even more expensive dams, and dams have gone up a hell of a lot in price since Teton, as you can imagine. I think that the margin of safety that's built in in Bureau designs, and others too, for that matter, probably have gone up considerably as prices have generally. So its financial feasibility hasn't improved; it's probably decreased. And everybody that's looked at it, including M-K and anybody else that the irrigation district can get to look at it, tells them, "You're going to have a hard problem justifying this benefit-to-cost as we understand it," and that's where it sits.

Storey: They never give up. You know, Auburn is still there. It keeps bobbing up to the surface.

Lloyd: Yeah, yeah. Sure, right. They've got the site. Just a little bit more and would make it go.

Well, the latest thing, of course, is, "Gee, if we stored that water, we could release it for salmon." We don't know if its going to help the salmon or not. That's a whole separate subject. They could sell some of the water for salmon release, presumably. Well, hell, it's being stored downstream anyway. If you build a whole series of dams, you could probably get a very marginal salmon improvement, even if it helped the salmon, which I don't think it will.

Storey: But even then, salmon were an issue?

Water for Fish

Lloyd: Well, they are now, on the rebuild.

Storey: No, I don't mean with Teton. I just mean with the region. What form was that taking at that time, do you remember? Was it just expressed concern? Were there people putting pressure on Reclamation to do things? How was that working?

Lloyd: For the salmon?

Storey: Yeah.

Lloyd: Oh, I think the clearest sign was on the Yakima drainage, where it had been recognized for a long time that that highly productive river was losing an awful lot of salmon fry to the fields, down irrigation ditches. They were being diverted from the river. And fish screens had been a way of life. I don't know if you've ever seen one or not.

Storey: No, I haven't.

Lloyd: They're a huge drum, twelve, fifteen feet in diameter, with perforated metal screens that slowly rotate against the current, so that trash is taken–

END SIDE 1, TAPE 2. MARCH 22, 1995
BEGIN SIDE 2, TAPE 2. MARCH 22, 1995.

Storey: So these big fish screens remove the trash and

keep the salmon from going down the ditches.

Lloyd: Yes. These are the smolts, the small fish. They're self-cleaning, in other words, these rotating screens. But the small fish that tend to hit on this screen are diverted back to the river, they're collected in a pipe and just diverted back to the river.

Remember, you've got a dam and a diversion. Just downstream of the diversion there's a rediversion of the fish. They ship the fish back to the river, after having hit the screen. These used to be very large because they went all the way across the canal, and then they discovered that the velocity was too high and would kill a lot of fish. They'd hit the screen, they couldn't get off it, and then they'd get dragged up as the screen rotated and aerated and killed, so they lowered the velocity to about a third, I think, of what it used to be, by angling the screen at a sharp angle to the canal. So you have a tremendous long structure and get the velocity down. And still works on the same principle.

But, anyway, yes, the Yakima probably would be one of the principle streams to have had early protective measures for downstream migrators, and they had they had fish ladders [unclear] Columbia. But fish ladders to make sure the adults can move upstream, both things to consider. And so that's the initial point of interest.

Mitigating Fish Issues in the Columbia Basin

But the whole Columbia system now is under high scrutiny, no matter whether it's the Forest Service logging and building roads, the Bureau diverting water, anything that will impact the salmon. Their endangered status is looked on with a lot of reservation. I don't think anybody has the answer to that. The simple answer is remove all the dams, the big dams, of the Corps of Engineers. Hardly anyone is seriously promoting that, except that the Idaho Plan. The plan that the governor of Idaho

thought would be a good one, would be to lower the level of the dams during the migratory period. This is the downstream migration. Upstream migration is not so much a problem. The ladders work.

But the downstream migration, the smolts, the small fish, perhaps six or eight inches long, they get wallowing around in the reservoirs, they have very low velocity, and they lose their way. And after they do find their way, they go swishing through a turbine, and that chops them up a little bit more. So the losses at every dam are, I don't know, 10 to 15 percent. If you go through seven dams, you don't have much left at the other end. I think everybody agrees that, yes, the dams surely have an effect, both for velocity reasons and for the turbine reasons, and you need to transport these little critters downstream if you're going to have dams as well as fish.

The governor said, "Well, why don't you just lower the dam during the migration period? That is, draw them down and then there will be less pond back there." These are relatively low dams on the Columbia. They're not 300-footers like some of the Bureau. Lower the elevation of the dam, you'd have less reservoir to contend with and you spill the water. Well, you lose navigation, lose the power, and people squawk about the non-beauty, so there's impacts with that. But we don't have any of those in Idaho. So it's a nice Idaho Plan.

Moving Fish Down River

Well, people in Oregon and Washington don't like that very well, the ones that live along the river. And it's not certain that it will help the fish. But theoretically it could, because they would get to move down faster because there's less reservoir to contend with and they'll bypass the turbines, until the turbines can be adequately screened. So the problem has heated up since the days that I was actively involved in it and now is kind of a diversion.

I've gotten involved with a man and another Bureau employee who think that a fish pipeline scheme is a way to transport the fish, the smolts, downstream. That is, you run water in a pipeline that's plastic, say, a very thin wall. No appreciable pressure, but it's suspended in the reservoir and the fish would get a ride, a quick one, that is, two to three miles an hour, so that they would go from, say, Lewiston, Idaho, from the first of the dams, down Bonneville some 350 miles. They could do that in natural time rather than wallow around in all these reservoirs–well, as a concept, simply a concept.

Storey: How do you get the fish into the pipe?

Lloyd: Well, you have collection systems, as they do now at the dams. In other words, there's a screening system that exists. For instance, at Lower Granite,[21] the first dam, there's a screening system that would pick up these smolts and carry them through the dam carefully; not let them go through the turbines. There was a trailing screen out in front of the dam before they hit the power intakes, there's a moving screen, again, and it picks these little critters up and puts them into a sloughsway and runs them down, bypassing the turbines.

And there are supplemental ways. There's the thought that–and it worked successfully elsewhere with other species of fish, certainly–is to ultrasonically herd them. Put in transducers, loudspeakers under water, and fish will avoid certain frequencies and pulse of patterns.

So this is an idea that is not going to have time to be developed before the salmon are

21. The Corps of Engineers began construction of Lower Granite dam in 1965 and completed the dam in 1984. "This congressionally authorized project consists of Lower Granite Dam, navigation lock, powerhouse, a fish ladder and associated facilities. The project provides hydroelectric generation, navigation, recreation and incidental irrigation. The dam, located at the upstream end of Lake Bryan, is about 3,200 feet long with an effective height of 100 feet." For more information see, US Army Corps of Engineers, "Lower Granite Lock and Dam," http://www.nww.usace.army.mil/Locations/District-Locks-and-Dams/Lower-Granite-Lock-and-Dam/ (Accessed December 2016).

gone, I'm afraid, it's that bad. There are very few left. It's kind of a search in futility, I'm afraid. I mean, if we're going to leave the dams and the benefits that they bring for power generation and all the rest, I think the salmon you're going to have to see in Alaska.

Storey: And, of course, we only have, what Grand Coulee and Hungry Horse on the system?

Lloyd: Yeah. Hungry Horse was never–yeah, they're on the system. But we have the Snake [River] system, you see, all the way through Idaho that's also part of it. The Snake joins the Columbia, and so you've got both branches [unclear] the place.

Storey: On the Snake?

Lloyd: Right, on the Snake.

Storey: What were people asking you, as Regional Director, to do to help the fish?

Increasing the Flows Through Fish Passages

Lloyd: One of the things that the power council spotted right off, this is when Dan Evans was the Chairman of the Northwest Power Council, was to make the uncontracted water in our reservoirs available for fish. "Just give it to us and we'll sluice it down the river when and if we need it." And so that was a little awkward. We said, "That's not an authorized use. We'll have to get some changes if we're going to do that." This is uncontracted water, water that was never signed up by the irrigation districts for standard purposes.

That's still a problem. I think they're now releasing it. The pressure's built since that time to make the water available. The other pressures, I don't know. Continue the screening. The screening that's taken place has been in place for a long time and improved greatly about the Yakima. I guess I didn't explain that, the historic screens didn't work very well, but we replaced them with modern

ones in the early eighties. But they're asking that be done elsewhere in the basin, say in other tributaries to the Columbia system, to protect the anadromous fish.

So there's a lot of money being spent on the prospect, screening of the turbines of the Corps plants, the Bureau work, making available surplus water, trying to do things, but they're all small changes with respect to the big problem which has everything to do with things like disease, over fishing at sea, El Niño. Gosh knows what all the factors are. Even the streams that are not affected by man's water operations, the costal streams are not having the same salmon returns in this part of the world, Puget Sound. They may be affected by man, but they've not been affected by big dams. I guess that's the thing. So it's a big problem.

Storey: And how long were you Regional Director?

PN Regional Director

Lloyd: Well, here I came in 1980 until '86. I left in '86.

Storey: And you retired then? Why did you choose to retire? Let's see. You would've been working–am I thinking right? Twenty-seven years. Twenty-five years.

Lloyd: Well, I have two military–I guess twenty-eight shows on my record, I guess. But I guess '61 to–yeah, I'd say twenty-seven years. Well, I guess I felt I'd had enough of the activity that there were other things to do, not all that compelling. But after a while, going over and over the attempts to get things done, there's a wearing-out process that you go through, I guess.

I could see that we were going to have more and more water for fish and we were going to be put in an untenable position, a very difficult position with respect to our traditional users. Not that that's all that bad, but I didn't particularly want to explain to them time and time again why it is we have to give water up for

fish or non-uses. I guess I felt I'd been through enough of the experiences. I think the users were very supportive. I have no complaint. I feel that in a lot of instances they were playing the system like anybody else would, in agriculture or business, and that is, if there's a good deal and the Bureau, a government agency, will do it for us, why, let's let them do it. And especially difficult was seeing how they would try to make sure they had federal money to do certain improvements and works where they could darn well do it themselves, or they could take an operation over themselves, if we would let it go. Well, this isn't building your empire; this is going in the direction in reverse.

They are the beneficiaries, after all, and if they can do and be monitored responsibly, we should do that. We should turn it over to them or sell it to them. But that looses the control of the water, and I'm sure the environmental community wouldn't like that very well. They liked to have someone they could do something with. So we were caught in between, but what the hell is new. That's the way it is when you're in a bureaucratic position with multiple interests. I don't know. But after a while that gets to be old. [unclear sentence]

Seeing a Different Point of View

I gave it up and then I did a little bit of engineering work for [unclear] and others in town for a while, in the water business. It was interesting to see the water business from their point of view, that is, as a large engineering firm, large consulting firm. There was no magic way to do the types of things that the Bureau used to do through them, by any means, except for loan programs. The small-loan program was one way, of course, that the consultants got in on a lot of Bureau-type business, little packages of very neat projects. It was very a successful program, and a lot of them have been done, but I don't think there's very many more. It afforded you some very low-interest money. The incentive, the reason to do it, of course, is that you got some darn good loans. But we worked

on a number of them, and they just were not forthcoming. Well, obviously. I mean, the water system is pretty well developed in the West.

Now what we're doing is in the phase of readjustment. We're finding other uses for it, from recreation to fish, to pollution control. The Boise River in the wintertime needs more water. It gets not bad, but it get's pretty heavily laden with mineral content because of the discharge from the sewage plant. They do a good job of treating it. But still you get an accumulation of things, you need more winter flow. That kind of thing has priority today. I suppose in John's [Keys] agenda, I'm not sure what it is, but that was coming on stronger. Water quality, that whole area.

I saw something on public television not long ago about one of the projects the Bureau built, I think it was in the fifties, the early fifties. The A&B Irrigation Project here in Idaho, it's an excellent project.[22] It's a pumped project. They pump their water. They have problems with drainage because they don't have the geography to take back to the river. They pump it and sometimes it ponds up, especially in the springtime. And that stuff ponds up and it's got agricultural waste or worse in it and it goes back into the aquifer. The state's finally saying this can't go on. So they're working on seed-back ponds, apparently, that have cattails and natural treatment associated with them to avoiding having to either shut the project down or pick up the water and ship it all the way back to the river where the river could accommodate this waste water or treat the waste water otherwise. They do it through nature's way. It's very fascinating. I hope it works for them. That would be a great salvage for the A&B Project, again, a very successful project. No problems, except that one. They've picked up some contamination in some local wells from time and time. I'm not sure it's the deep wells they're pumping from, Brit, I think it's the shallower wells and some of

22. The A&B Irrigation Project is part of the Minidoka Project in Idaho.

the farmers themselves are taking out of, that recognize it.

So I have not regretted getting out from the system, but it was exciting and I'm glad to have gone through it.

Storey: Tell me the skills and basically the K-S-As you think a Regional Director needs.

KSA Skills

Lloyd: I think his communication skills are absolutely essential, both to employees and to the public. Those are not exclusive. I guess that's the same package. An ability to express national goals and objectives in a manner that's not offensive. I guess that's still communication, not offensive, or acceptable to local constituencies who are locked into a way of doing business that may not be as broad-thinking as–In other words, act as the conduit to the new messages about efficiency, economy, environment, water quality, and all these hot management topics that are high in priority. You have to be able to do that; maintain your credibility. When you come to the public, say, "We're going to help you," try to prove it in some way. That's the thing about this A&B Project. If the Bureau, I don't know if they wouldn't want [unclear], but really if they can see that they've got a problem and the Bureau's technical expert can at least help them. I mean, after all, geez, I mean the Bureau brought great technical expertise. And that's the reason for them to be in the business in the first place, not to watch over, necessarily, these projects that are successful and running well, but if you can bring to them an expertise of a good technical organization and deliver it, the constituents are appreciative.

And you soon learn, that is, a Regional Director, you probably have already to get to that point, that satisfaction of the political system is damned important. You're not a technician. You have to read what it is that your supporters want and need, and try to deliver a portion of it to them through their elected

representatives, I guess. Am I making sense? You have to contact with them in a way that doesn't give them great heartburn at the same time.

You go up to a reservoir, for instance, and you've got trespass problems there. We call them trespass problems. Somebody built a boat dock on Cascade Reservoir, a number of people have, and you're not supposed to have them there. And we've tried to tell them that over the years. You say, "Well, we're going to give you three years to get them out of there." Well, all hell breaks loose. I mean, they just don't want any part of that. There's got to be a better way. I mean, we've got a right to get them off there. We say, "You ought to have a public dock down here. That's what you homeowners should do." Well, we say, gee, for sensible management, we don't want a dock here and a dock there and a mess and they get broken up and people leave them. It's not good management.

Ensure Congressional Involvement

Well, you get a congressman involved in that, and they at first don't understand what your problem is, or don't choose to. So you have to thread your way carefully, like all federal or state managers of resources have to deal with these kinds of things. You'd like an orderly management. And you have to show some willingness, I think, to moderate your position, too. You just can't bring out, "This is the law and therefore I am."

Our newest congressman, Helen Chenoweth, who's a real good old gal, she gave the feds hell for being heavy-handed with a rancher who shot a wolf, allegedly, or at least it was shot on his land. These new wolves that have come out, well, one of them was chewing on a calf, I guess. Somebody shot it. And then the feds came on the scene, Fish and Wildlife agents, and they were armed. I guess she alleges that they were heavy- handed. Well, I don't know. But you can't be that and be a Regional Director for long.

You think about how people got in trouble being Regional Directors. I guess it's being too doctrinaire, simply not understanding that they have their problems, "they" meaning the landowners. Especially if the congressional delegation had no support at all, you're in deep doo-doo if you're doing something that both the congressional delegation can't appreciate, can't understand. They don't understand your problem and you're trying to effect something, why, that leads to real problems. So our rule was, my rule, and I think most of us would want to brief the congressional people carefully about anything we thought was going to be controversial with Bureau business. I'm sure the Commissioner has done that from time to time, but these were lesser matters that hopefully the Commissioner wouldn't have to wrestle with, other than to know that they're going on.

But liaison with congressional delegations and with the states, crucial, not to get in crossways when considering the state's role in not only water rights, which is standard throughout the West, state's have a lead role, but also in funding, too. We've had the Columbian Basin Project, the state of Washington is a big contributor, had been in the past. That's an important thing, an important part of their economy. This was not a totally federally funded thing. The state puts money into it and continues to.

So what else? Knowledge, skills, and abilities. I guess it's useful to certainly understand the engineering that goes into the works that we deal with. It doesn't necessarily have to be power. But you'd better have a fundamental grasp of times involved, doing certain things, and the need for care and collecting the right information for engineering decisions.

I guess being able to spot people, too, that you can work with, probably more importantly that will do the organization the good that you want to have done. The selection of people, that's crucial, because you get to at least screen

and probably select the top people in the region. I guess personnel skills in that concept, in that area, are important.

Storey: Tell me a little more, if you would, about contacts with congressmen. How would you brief them?

Communicating with Congress

Lloyd: Very specific. We'd make an appointment. Well, we'd go to Washington a couple of times a year, whether you need to or not, because of program conferences and "skull" sessions, whatever–used to, anyway. There will always be some subject that's of particular interest to the congressman. Well, you know, there's fish screens in the Yakima, or what are you doing about new water for some irrigation district. You make sure that you contact them periodically and tell them what you're going to talk about. You can do that and add a few more things, too. If there are some other little ones, you could certainly bring those up either directly to the congressman or to the staffers, one or the other. A trusted staffer is just as good. In fact, you can probably can talk a little more at length and get some feedback. The officeholder is a little nervous about sometimes. So a good relationship with the staff is essential.

Another contact we had that may look like a bunch of meet, greet, and booze it up, but was important, was the N-W-R-A [National Water Resources Association] sessions. I don't know if they still have them or not. But that's where all the water users that were politically active, and most of them were, would come to meetings, wherever, Sacramento or Las Vegas, once a year, and met with the Commissioner, allegedly. The Commissioner would sit down, and the users would be there and you would be there, as the director, and the Commissioner would have his Chief of Staff, and they'd bring up a topic of interest to them, whether it was rebuilding of Teton Dam to the, "high-price, Commissioner, you're going to charge us for our share of the safety-of-dams work that's going

on," every goddamn thing that they could think of. And usually you knew beforehand what it was.

They might give you a shot at that time, and they might say, "This director's doing this," or, "We like him because he's doing that."

Storey: They might shoot you or give you a boost. (laughter)

National Water Resources Association

Lloyd: Shot you or give you a boost. Usually you knew if they were going to shoot you. So this was kind of your report-card session. They ran them in close-order drill. I don't know if you've ever heard about these before.

Storey: No, I haven't.

Lloyd: N-W-R-A is kind of a ritual of the Bureau. It could be any other organization for that, but that the National Water Resources Association. It used to be very, very important. And a few things got done, it genuinely did. There were a few misunderstandings that got wrestled out. But the constituents felt, if that's the right term, the clients, the customers, felt they got to know the Commissioner. The Commissioner heard their problem and he got the top of the news that way, throughout the whole Bureau West. So we took those pretty seriously and were prepared for them. The Regional Director damn well better come and hear what they've got to say about him.

The funniest time, you know, Jim Watt[23] was a loose cannon. I mean, he still is. Jim Watt, the Secretary [of the Interior]. We were down at Salt Lake City, a big meeting down there, N-W-R-A, in the wintertime. And Jim Watt's carrying on at the podium on the Teton people. You know, I'd given them a bunch of stuff. "We'll go back and look at it again." You don't tell them no, you tell them, "We'll look at it again." I get

23. James Watt was Secretary of the Interior under the administration of President Ronald Reagan from 1981 to 1983.

something nice done for them and showed them some consideration. Listened to them. God, they got a hold of Jim Watt and they said, "Bill Lloyd, he's so wonderful." And Jim Watt get's on, "Who is this guy that's done all these wonderful things for the Teton?" He made some nice gratuitous statement in public that was not at all needed. But Jim was like that. He'd just shoot down. It could be the other way, too. It could be, "Who is this dumb dodo that's done this?"

But the point was that it was a place to hear the top of the news from the districts and let the Commissioner hear it, and maybe the Secretary if he's there. Sometime the Secretary is persona non grata. [Secretary Cecil] Andrus[24] came to it down in Texas. They damn near had a knock-down drag-out over his attitude about the hit list and all. That was the low point, as far as relationship with the Interior were concerned. But Reclamation is still those constituents' agency. "Reclamation is, by God, our outfit. We like them. They don't always do what we want, but we can steer them somewhat." And they get that feeling through N-W-R-A. That's my point of view. I don't know if it's true or not. That's the feeling I got. I thought it was important.

Storey: Good. Well, I appreciate it. I'm afraid we've run over our time.

Lloyd: Oh, my goodness.

Storey: Rather substantially. But I'd like to ask you if you're willing for the tapes and transcripts from this interview to be used by researchers.

Lloyd: Sure.

Storey: Good. Thank you.

Lloyd: I'd like to add, though, I'll give you some dates. I will go and I'll put them in the mail to confirm these screwy dates.

24. Cecil Andrus was Secretary of the Interior under the administration of President Jimmy Carter from 1977 to 1981.

Storey: Okay. We can do that as an addendum.

Lloyd: Okay. Fair enough.

Storey: Thank you.

END SIDE 2, TAPE 2. MARCH 22, 1995.
END OF INTERVIEWS.