Male Speaker: Hard question first. Please say your name and spell it.

Adam Birkenbach: Adam Birkenbach, and it's spelled B-I-R-K-E-N-B-A-C-H.

MS: Adam, could you tell me the year you were born and where?

AB: 1937 in Michigan.

MS: When did you first come to San Pedro, the port area?

AB: I graduated from high school when I was seventeen, joined the navy. They stationed me on a destroyer at Terminal Island in 1954. So, that's probably the first time I came into the San Pedro area.

MS: Coming into the port, did they make any impression on you? What were your first thoughts about the port?

AB: Well, at that time, the port consisted of small slips, a lot of old warehouses. It didn't look too nice on Terminal Island. The canaries were in full bloom and you could smell them when they were canning all over. So, it was a different world than it is today.

MS: So, I take it you were not a lot impressed then?

AB: No, not too much.

MS: So, you were stationed here. Did you decide to stay here afterward?

AB: Yes. I was in the service from [19]54 until [19]58, and I had the GI Bill. So, I decided to stay here and go to school.

MS: So, where did you go to school?

AB: I went the first two years at East LA College and then Cal State LA after that for the last two years.

MS: So, what brought you back to the Port of Los Angeles?

AB: Well, when I graduated from college with a degree in electrical engineering, I went to work for the Department of Water and Power as an electrical engineer. I worked for them for, basically, seven years and found a promotional opportunity to come down to the port. So, in 1968, I took a position at the Port of Los Angeles, which was, basically, a chief electrical engineer.

MS: So, what were the differences from an electrical engineer's point of view of a port like Los Angeles and the other kinds of experiences you had?

AB: Well, the work I was doing at Water and Power was general facilities type of electrical work on steam plants, office buildings, commercial facilities. I wasn't limited at the Water and Power to just working on generation or underground facilities, but it was in a squad that did work on all their facilities all over.

MS: But at the port, what kind of work did you find yourself doing?

AB: Coming down here, designing lighting systems and electrical systems for our new container terminals for a high voltage power to the container cranes, and a lot of high-mast lighting. At that time, the port was just getting into the container age and you had to have a lot of open space. So, it meant very high, a hundred-foot or taller light bulbs.

MS: So, what were the biggest challenges you were facing when you came here?

AB: When I first came here, the biggest challenges were designing the high voltage systems for the cranes and developing a ground fault detection system for an ungrounded 2,400 high voltage system.

MS: Explain to me, what is that? Give me a more layman's description of what you were doing.

AB: Well, the high voltage system, the 2,400-volt system they were using at the port – and they only had one terminal using that at the time. Well, the 2,400-volt system did not have a ground fault detection tripping system. I was familiar with some of that from the utility company. So, we had to design a special system to handle the 2,400 high voltage systems in the crane. In case there's a short, it doesn't melt everything down, but trips the fusing system off immediately.

MS: So, ground fault is essentially a short of some kind then?

AB: A ground fault detection system, yes. A ground fault is a short. The detection system is a means of taking the electrical system off a line or out of commission when you do have a fault.

MS: Also, all the electrical system in the port was underground. Was that something that was new and different to you or something you got to get used to?

AB: No. At the Department of Water and Power, all of their facilities were, basically, underground, except there may be street distributions. No, it wasn't that unfamiliar to me.

MS: So, when you came here and as years went by, how did the electrical needs and the electrical system begin to change and why did it change up here at the port?

AB: What started the change, probably more so when we started putting more cranes on Terminal Island because the utility company had, what I considered, a soft system on Terminal Island. They had the highest voltage. It was 3,500, and they were doing most of their distribution to all the sheds at 480 volts. The cranes needed higher voltage than that. Then at that point, we were using 2,400 volt and we shifted to a 4,160-volt system to power the cranes. The cranes were getting the larger, the motors were getting larger. When you went to solid state

operation, the soft system makes the cranes run very inefficient.

MS: Talk about that transition to solid state from the kind of (generator?) and different electric system you had before. Was that a big change and what impact did that have?

AB: Well, the first cranes were, basically, motor generator operated. The high voltage operated a motor that, in turn, drove a DC generator, and the hoisting motors were all DC operation. When they switched to solid state type drives, the incoming voltage is still AC, but it's a solid state conversion to DC. It's more susceptible to voltage drops and weak systems.

MS: Was there any particular crisis that you had or accident you had that you can remember with the electrical system?

AB: Prior to me coming to the harbor, probably within six months before I came to the harbor, they had one of the 2,400-volt systems that did not have a ground fault detection system on it over at Berth 131. It shorted out in the Orangeburg type of conduit, which the heat causes gases to go through the conduits into the manholes. Eventually, it exploded, driving the manhole covers, (threw?) containers in two, three hundred feet in the air and whatever.

MS: [laughter]

AB: So, that was one of the reasons that when I came down here, we had to develop a detection system for the high voltage, a detection and tripping system.

MS: So, did you talk to any of the men who were witness to that? Did they tell you any stories about what they saw? What did they say to you?

AB: I talked to a couple of the engineers that were here. Nobody that I recall actually saw the accident, heard it and went off and saw the results of it. But a similar system to this at the Rio Hondo College in the [19]60s went to ground and tripped. A maintenance man and an instructor went to the high voltage system and turned it back on. They were both killed because of the gases that exploded.

MS: During your tenure, were any other crises or near misses that you remember?

AB: Not with the electrical system.

MS: What are the other things then that you had to deal with that were problems then outside the electrical system?

AB: Well, in 1979, I promoted from being a chief electrical engineer to a harbor engineer position and got into engineering management. I went back to school at night and got a master's then in public administration. At that point, I started supervising not only electrical but mechanical, civil, and spec writers and everything else.

MS: So, then later on, what were the crises that you faced then at that point?

AB: Oh, the major crises are probably projects we came into at that point in my career was the deepening and dredging projects within the harbor. I think during my span or my career here at the port, we went through three major dredging projects. Deepening the harbor, originally from twenty feet, thirty-five feet, forty-five feet, and now to fifty or fifty-two feet is what's the latest depths are.

MS: From an engineering point of view, what is that job? Describe what you have to do. What are the challenges of dredging?

AB: Challenges of dredging in older harbor is how do you bring deep water to the (face?) of a berth that was designed for twenty-five foot or a thirty-five foot without undermining in the existing wharf and making it useless. So, there's a challenge of a slope design under the wharves to keep them from falling away So, you've got to analyze the existing slopes that are under a wharf, how they were built. Determine whether, at the phase of the wharf, you can do any dredging or you have to go and drive an underwater sheet pile wall at the phase of the wharf to be able to bring the depth close.

MS: What kind of equipment is involved in doing that kind of work?

AB: Well, there are several dredges. You've got hopper dredges that, basically, are loaded by a clamshell. Then when they get full, they go out. The bottom of the hopper opens up and drops everything out of it. So, that's, basically, done with the clamshell type of others. But for the major jobs we had here, they brought in the large suction dredges. Well, the suction dredge they brought in – I think the first company was (Botasnik?) that came in and brought their large dredging that was later bought out by – I can't think of the name of the last company that did the major dredging.

MS: How does the suction dredge work?

AB: It has a…

MS: You have to start, a suction…

AB: Basically, like a vacuum cleaner does, but underwater.

MS: No. A suction dredge, you have to use that in your sentence.

AB: Yes. Suction dredge has a cutter head on the end of a nozzle that – I think it is about three, four thousand horsepower that churns the bottom up. Actually, it digs it loose. It's a three-foot diameter pipe through a large motor. It sucks up all that sand and ships it through a pipeline that is either floating or submerged. It's a three-foot diameter line that could be depositing this dredge two or three miles away. So, you have a long pipeline. That's how Pier 300 for APL was created and how Pier 400 was created.

MS: Let us talk about Pier 300. What was your role with that and what were the particular

challenges of that for you?

AB: I think the biggest challenge in developing Pier 300 was trying to consolidate or solidify the fill material. That project was, basically, designed by the Corps of Engineers. Not really a well-designed fill. They designed the dike and just pumped all the material they sucked up off the bottom of the harbor behind the dikes until it got probably twenty feet above the waterline. That included the bad silt materials of clays and everything else that came off the bottom. When that material dried, it dried and cracked in the fisheries some four or five feet deep every two or three feet across the whole thing. It looked like a moonscape. Basically, because of the way the fill was brought in there and it wasn't a designed fill. So, the port had to go through a major compaction or consolidation project to make that material hard enough you could build the terminals on. In part of doing that, the port with geotechnical engineers installed, what they called, weak drains, which was a material about four inches wide and a quarter inch, three-eighths thick. That was pushed into the ground down fifty to sixty feet about every meter and a half. Basically, the purpose of that was to allow the water to come up that was trapped within all of this type of fill. In order to get that water to come up, the port had to put about a two-foot layer of coarse sand at the top of these weak drains. On top of that, pile a thirty-foot pile of dirt to give it weight and enough pressure to push it down and bring the water up. So, I think we brought in a million yards that covered only thirty acres. We had about three hundred over there. So, every six months, we had to move that million yards of material to another location. So, it was a major, I'd say, five-year project to get that completely consolidated.

MS: [laughter] It sounds like it.

Female Speaker: Can I ask and just answer to him, why did the Army Corps of Engineers do the dredging and did the dredging for Pier 400 as well? Just explain that to John.

AB: The dredging is under the design control of federal government. The federal government or the Corps of Engineers controls all waterways in the U.S., flood control facilities, rivers, and streams. So, anytime even in the flood control areas up by San Bernardino if they developed a dam on there, that's done with the design and under the contracts of the Corps of Engineers. They control all the harbor facilities and they test everything. Before the port could build Pier 300, we had to go to the corps. The Corps of Engineers has a model of the harbor. It covers over an acre of land inside a shed. They have all the data on tides, wave generations, and the capability to make these waves and water movements on the model. Any change in these features of the harbor have to be modeled at the Corps of Engineers. So, you know how you're going to change the circulation in the harbor and how you're going to change, whether your facility is going to have problems from surge or other natural occurrences in the ocean.

MS: Tell me about Pier 400. Were you involved with that?

AB: Yes, I was the assistant chief harbor engineer and the chief harbor engineer during the development of Pier 400.

MS: Tell us what that is. People do not know what that is. How was it built and how was it used? Hold on one second. [coughs] Go ahead.

AB: Pier 100 is…

MS: 400, start again.

AB: Pier 400 is…

MS: Start again one more time.

AB: Pier 400 is a peninsula of land off of Terminal Island that consists of a little over four hundred acres, accessed by a causeway that brings the roadway and utilities out to Pier 400. Originally, it was going to be a facility called Energy Island. During the process of creating Pier 400, the energy island aspect of that was supposed to be where most of the oil facilities in the harbor were to be relocated to. The oil companies negotiated with the environment, a change in how they handled their products, a change in their products and other things to allow them to remain where they presently were at that time. When Pier 400 was built, it was still projected that the end of the peninsula of 400 would still be there for major oil facilities, for import and export. During the development and filling of 400, it was decided that the port was going to have more say and more involvement with the design of the fill, so that we wouldn't have that problem of consolidation so much like we had at 300. In order to get the Pier 400 project moving sooner – because the original dredge contract to go to the harbor down to forty-five feet took seventeen years to go through all the federal regulations and permitting process to get that permit and to get the funds to do that. So, to speed up Pier 400, the port worked out in agreement with the Corps of Engineers that the port would advance the money for the dredging. The corps, as they were able to through their federal budget process, would repay that money over a length of time. So, 400 was able to be escalated and finished to match more of the demands of what the industry needed here in the port.

MS: Well, it changed from an energy depot to something else. How did that happen and what did it change to?

AB: Well, it changed to…

MS: Pier 400.

AB: Pier 400 changed to be not just an energy island – well, it never was going to be completely an energy island. It was going to contain the container facility and oil facilities. But in the negotiations with Maersk, somehow it ended up that they were going to get eighty to ninety percent of that to be a container facility. I believe there are still twenty acres or twelve acres set aside for least tern nesting there. There's an additional – and I'm not sure of the number, fifteen, maybe twenty acres, and I understand is going to be used for oil facilities.

MS: Why are the least terns part of the harbor here? Why did get that…

FS: Where are they anyway?

MS: What are they and what are they doing on a container island?

AB: Least terns are a small…

MS: [coughs] I am sorry. Start again. I was coughing.

AB: Least terns are a small water bird or a shore bird that were put on the endangered species list for this area. I'm not sure they're really that endangered because you see them all over the beaches in Mexico, too. But being so, it was deemed that in order for the port to develop all that facility, we had to create a nesting site to keep the least terns propagated inside the Port of Los Angeles. So, there was originally a site set up on Pier 300, is where it started. At Pier 300, we provided twenty acres for several years as it was being developed, relocating the site as necessary. Then when Pier 400 was built through the dredging process, permission was given to move the least tern nesting site out to Pier 400.

MS: How did the environmental movement and environmental, how did that change your work?

AB: Oh, it made the permitting process…

MS: Environmental movement.

AB: Oh, the environmental movement made the permitting process for any new project a lot longer. You've got to go through the environmental and mitigation process. In doing that also, the port – because they were filling in what was considered shallow water habitat for the seabirds and fisheries and everything – had to mitigate the ability to fill the area. Part of that mitigation was the development of Batiquitos Lagoon down just south of Carlsbad. I think the port spent something like fifty-four or fifty-five million down there restoring that lagoon.

MS: We heard about that from another…

AB: Probably from (Vern Hall?).

MS: Yes. You took a number of trips to China. Why did you do that and what were you doing went you went there?

AB: The first trip I went to China as a representative for the port was part of a People to People program. The first time I went was in 1987. At that time, I was the electrical engineer and I was a member of the industrial lighting committee of the Illuminating Engineering Society. That group put a People to People trip. Basically, that is a group of engineers from the United States, prepared presentation papers. We visited various cities in China and met with the engineers and their counterparts. They also had prepared papers. So, we had presentations from United States representatives and presentations from Chinese representations or engineers. Basically, I think the first trip I went over there was nineteen days of presentations and exchanges. Second time I went over there, I put a trip together for People to People and just took port and harbor engineering designs. It had nothing to do with the electrical industry anymore. That was actually when the demonstrations were going on about the Tiananmen Square incident. In fact,

our group left China just a week before the soldiers came in and shot the students at Tiananmen Square. I think at that trip, I had eighteen people representing the port and harbor industry. I think we went to eight different cities and made presentations to port and harbor design facilities in China.

MS: Now, what was the purpose of all of this?

AB: Well, People to People organization was put together by President Eisenhower to create more goodwill between countries. It's still ongoing now where they put together trips like that to all various countries. It's not just China. Therefore, different industries can handle them. The port and the harbor, engineering, electrical associations, other things all put together separate trips.

MS: Now, as the port developed, China became one of your biggest customers. Did that affect your relations and travels with them?

AB: No. China as being one of the largest trading partners with the ports, but our traveling there, I think, created more goodwill in doing that. There are three different People to People trips and two private trips with private organizations to promote trade or business with China.

MS: Now, what was the highest position that you attained at the port and how long did you have that position?

AB: My highest position at the Port of Los Angeles is I promoted to chief harbor engineer at the end of 1994. I held that position until I retired in 1999.

MS: What were your responsibilities in that position?

AB: At the time I retired, I had all of engineering and construction management divisions under my supervision. The responsibilities of the chief harbor engineer is to oversee the design and construction of all the new facilities in the port and improvements to the port, and to manage the capital development program.

MS: That is all? [laughter] That is all you had to do? That is about it?

AB: That's all. [laughter]

MS: It sounds like a pretty easy job. It sounds that it is.

AB: Yes.

MS: [laughter]

AB: It takes a little bit of time sometimes.

MS: What was the hardest part of that, all that responsibility?

AB: The engineering part of being a manager or supervisor like that is probably the easiest part of it. Managing people is a little different story. It's a little bit harder handling the people than the personnel problems that come up than handling the engineering problems. We're well trained to handle engineering problems. It's personnel problems and the uniqueness of what comes up that is harder to handle.

MS: You call that human engineering, yes?

AB: Human engineering. [laughter]

AB: That's a good way to put it.

MS: [laughter] Looking back at your career, starting when you first came here, what are the big changes from that first time you got involved in the port when you came here [inaudible] until the time you retired? Give us a sense of how the port had changed. Was it a slow gradual change? Was it an enormous change? What happened at the port during your tenure here?

AB: I think it was a slow change.

MS: During the time I was here…

AB: During the time I was here and I came here at 1968 until 1999, it was a slow gradual change that went from having a harbor that was so polluted. You didn't have to worry about the temporary piles in the back bay of the harbor because nothing lived back there. Until the point when they started to clean up the water and then they had to go on a massive program to wrap all the temporary piles with plastic to keep them from being eaten up. The improvements in the environmental aspects of the harbor, the changes that went on – when I first came to the harbor, when you went into these old sheds and had to go to the restroom, you look down and you looked at the water. After that point, sewers have gone in, new facilities. The old warehouses have been taken down. There's only a couple of warehouses left now in the harbor as the majority of the international traders now containerized that.

MS: But what about the scale of the place? How did it change when you came in at [19]68 to [19]99? I mean, just Pier 400 alone is this enormous, physical change. How did the scale of the harbor change in those years?

AB: Well, I know it's grown in size by, at least, a thousand acres of land because of all the filling projects. The amount of trade has probably gone up twenty times. The containerization was one of the biggest aspects of the change in how the harbor operated and how they're able to handle the trade and the products that come in here. The old ships that used to be unloaded manually by longshoremen would come in and maybe would handle one-tenth the amount of cargo that's on the new ships. It would take them a week to unload it by hand and load it. Now, they turn around a ship that's ten, twenty times the amount of cargo in a twenty-four-hour period.

MS: Again, of your work here, what do you look back at with the most amount of pride?

AB: Well, what I get my most pride from working at the harbor for all these years is to see the changes that have gone on. The technology that has been implemented into the harbor that has helped promote the amount of cargo, promote trade, the amount of improvements to the people that worked at the harbor. The manual labor has gone now to a point where it's mainly skills labor in the harbor. Enormous cranes that are going in here right now, the technology to operate those at high speed, and to keep the injuries of the personnel down on these terminals at the same time. The longshoremen have a tremendous job in trying to keep up with the technology.

MS: How would you compare the Port of Los Angeles with other world ports? Are we a leader or are we a follower or are we sort of typical? What would you say?

AB: Port of LA has been a leader in many of the developments that have gone on in the port. They've always promoted in…

MS: Say in the world, not the port.

AB: Well, in the world. Yes.

MS: Start again. So, the Port of Los Angeles has been a leader.

AB: Port of Los Angeles has been a leader in the development, in the use of technology, in the world. They've been one of the foremost ports to try to develop in this manner.

MS: What are the particular areas the port has been a leader?

AB: I think in the environmental aspect of the port, the port has been a leader in pushing the development of cleaner air, cleaner operations, cleaner water.

MS: Is there anything else that you wanted to tell me? Anything I left out that was important to you to talk about?

AB: No, I think we've covered pretty much what's going on in the harbor.

FS: The only question I have and in talking with you beforehand, I was under the impression that maybe it was just a total of assumption on my part is, that some of the trips that you had made to China were on behalf of the port. Were any of those trips on behalf of the port?

AB: All the trips I made with the People to People exchanges to China were on behalf of the port.

FS: Oh. Yes, it was not [inaudible].

MS: I have a question then. Was there anything at all in these exchanges that you learned in China that you could benefit here?

AB: I believe it was the second trip that I made to China, 1989. I observed a technique of consolidating the fill material that is created from dredging and putting that dredge behind the rocks. The port in China used, what they called, a vacuum assisted consolidation. In preparing the soil to create this compaction, they did the same as we did with the surcharge. But instead of a surcharge, they put in the weak drains. On top of those weak drains, they put a layer of sand. Then they put a plastic membrane down, beamed it up, and flooded it with about a foot of water. With the piping system under the plastic, they drew a vacuum under the plastic. If they could draw one atmosphere of vacuum under the plastic, that equated to twenty feet of fill on top. I did bring that technology back, got the engineering department here at the port to do a two-acre test site, which we did on Pier 300. That's the time we were using Pier 300 and spending all the money moving the million yards all over. We were about, I'd say, sixty percent through that project of moving the million yards around. We found out if we would have used the vacuum assisted method of consolidation, we would have saved $10 million on that project.

MS: So, you did not need to use it at Pier 400 then?

AB: At Pier 400, we didn't. We thought coming into it that it might be a good method to use on it. However, when we got involved with the Corps of Engineers and had more control of the fill and the design of it, we didn't need it. Instead of putting the bad soil in all of the good, we separated the bad areas. Have that transported and dumped into a shallow water habitat by Cabrillo Beach and put only the good material into the Pier 400. Even to the point that we went to some areas that had real good sand and mine those areas to get extra good sand, so we didn't have to use any of the bad material. Probably doing that saved the port $20 million in just consolidation of the Pier 400.

MS: I think we got it.

AB: Thank you.

MS: Thank you very much.

[end of transcript]