BOEM DEEPWATER GULF OF MEXICO HISTORY PROJECT

OFFSHORE ENERGY CENTER HALL OF FAME

Interviewee:	Joe Lochridge
Date:	October 10, 2009
Place:	Houston, Texas
Interviewer:	Tyler Priest
Ethnographic preface:	Joe Lochridge grew up in central Texas, and attended Rice University on a Navy ROTC scholarship. He served aboard an active-duty destroyer during the Korean War, and then had the opportunity to transfer to teach at the U.S. Naval Academy in Annapolis, MD. An engineer, Lochridge moved to Brown & Root after leaving military service. He first worked in the marine design group, working on offshore structures primarily for Lake Maracaibo and the Gulf of Mexico. Lochridge was briefly detailed for Brown & Root work in Libya, but returned to Houston in time to start working on the landmark Project Mohole in 1962. During the remainder of his time at Brown & Root, Lochridge became involved primarily with pipeline work, including line laying and maintenance.

File 1

TP: This is an interview with Mr. Joe Lochridge for the Offshore Energy Center Hall of Fame induction 2009. The date is October 10, 2009. The interviewer is Tyler Priest, and we're in Houston, Texas.

So let's just start with a little background. Tell us where you came from and how you got involved in this whole offshore business.

JL: I was brought up in Waco [Texas], went to high school there. I went to school at Rice University. Came down here. I managed to get into the naval ROTC, and so I had a navy scholarship while I was there. Then I was supposed to serve two years active duty in the navy, but while I was in school the Korean War started, so they extended that unilaterally to three years. Then after I'd been aboard a destroyer for a couple of years, I had an opportunity to transfer to the Naval Academy to teach. So I went from the Pacific Fleet to the Naval Academy.

TP: What were you teaching at the Naval Academy?

JL: I was teaching five courses, if I can remember them all. One was marine engineering, and metallurgy, hydrodynamics, hydraulics and something else. I'm not sure what the hell they were right now. I don't recall. But anyway, it was a very worthwhile adventure being up there, and I enjoyed it. I had received my B.A. degree from Rice, but I wanted to get a B.S. in civil engineering. So after I got out of the navy, I went back to Rice for a year to get my B.S.

When I left Rice, I went to work for Brown & Root, and my contact with Brown & Root was one summer we were standing out around a dormitory leisure area, and a friend of mine, I was talking to him about how I was looking for a job to do for that summer, and he said his cousin was working on this Union Carbide plant down in Seadrift. They were building it, and they were looking for draftsman. Well, I thought I could probably handle that, so I went down there and interviewed, and I worked there for one summer, and that was my first contact with Brown & Root. I made several friends there, and then after I got out of the navy and went back to school, some of my old friends I was going to school with were working at Brown & Root. So I talked to them.

TP: There was a Rice connection then, right?

JL: Of course, George and Herman Brown had a little bit to do with that. Anyway, I went to work in a small group in the Marine Engineering Division for Brown & Root, and the first couple of years I worked—

TP: Was that the marine design group?

JL: Yes, the design group. We worked on offshore structures, Gulf of Mexico and Lake Maracaibo primarily. Then I was sent to Libya and worked over there for a couple of years. That was an interesting experience, to say the least.

TP: Was that a pipe? That wasn't pipeline—

JL: Well, this was Esso Libya, and they had discovered oil down in the Zeltan field, which was about 120 miles south of the Gulf of Sirte. It was south of Sirte. We had a camp right on the beach, and I was responsible for the marine surveying and then was a field engineer for the construction of the terminal there. We built some structures, buildings, office buildings, and Chicago Bridge & Iron put in some tanks, storage tanks, and we installed that offshore pipeline to go out to a loading buoy, where tankers would come in and load up and take off from there.

Then when that was over, that was '61, I came back to Houston and was only there for a short time, and some of the people I worked with before had started on the Mohole project. It had just kicked off and was only under way for a couple of months, and they asked me if I'd like to go on that project. That was located in downtown Houston. I was working out on Clint Drive, thought the change would be nice. So I went on downtown then and worked on the Mohole Project for four years. I started there in '62, and Congress pulled the plug on it in '66. So that was the end of the Mohole Project.

TP: Tell us a little more about the Mohole and what exactly you did on the project.

JL: Well, the primary aim of Project Mohole—the word "mohole" came from the Moholerovicic discontinuity. We were attempting to drill down to that, which would reach the earth's mantle, and it's closest to the surface in ocean regions. Of course, it would have been much easier to drill from land, but it was so deep in land, they felt like it wasn't really practical. So there were several sites that were under consideration to go offshore for drilling. So we were doing the design schemes for the equipment to drill. Site selection had not been finalized, but it was going to be between Puerto Rico, a little offshore of Puerto Rico, and a place off Hawaii, off of Maui.

TP: Was it like 14,000 feet of water or something like that?

JL: The water depth would have been anywhere from 10 to 15,000 feet, I think, and the total drilling depth was to be 35,000 feet from the ocean floor to the mantle. So we had designed the drilling vessel, which was one of the first semi-submersibles, and out on the floor was a lava bed. My responsibility on that were the tubular goods, primarily, the drill string and the riser casing, and also we provided consulting services to some of the other departments because we had a corrosion engineer and metallurgist. So we assisted other departments in their areas, but primarily it was the tubular goods and pipe handling system aboard ship.

So I'd say we spent most of the time in analysis of the drill string or the total depth from the attachment to the vessel to the bottom of the hole eventually, how to achieve cores, retrieve them, and in order to return the drilling mud, we had an external riser around the drill pipe, and that was continually circulating mud through that, and because of the depth of the riser, we had to put buoys every so often to help support them.

TP: Keep them buoyant, yes.

JL: We did some research on that and finally determined that syntactic foam buoys would be the best because the deeper ones could withstand the pressure, and they were efficient. So those had been designed. Most of the design was pretty far along before the plug was pulled on it, but my responsibility primarily was in the design and the specification for the drill string and the riser, materials. We did testing, fatigue testing. There was a lot of fatigue testing on the material. It was basically [unclear] and fatigue testing, both at Southwest Research Institute and at Batelle Memorial Institute in Columbus, Ohio.

We had designed and were in the process of starting to build a full-scale fatigue-testing machine for production line drill pipe, and this was going to be built out at Rice University, but before we got started on it, why, that was the end of the project.

TP: What was the deepest that a drill ship or semi-submersible had drilled up to that point? I mean, 14,000 feet was a huge leap.

JL: Yes, it was, and this, of course, required dynamic positioning, and we had designed our—I say "we." That was not part of my purview; this was another department, but they did design the dynamic positioning, and that was well under way too.

TP: I know Shell and others were working with the *CUSS 1* on pulling dynamic positioning on that about the same time.

JL: Yes. The dynamic positioning concept was not new. It had been used, but we were going to have to stay on station for several years, and so this introduced problems of maintenance and repair on the positioning system and on being able to take the actual propulsion motors and being able to retrieve them, overhaul, repair, and replace them, and so forth. So quite a bit of effort [unclear].

TP: So was any of the design work you did on Mohole, did that contribute to deepwater riser and drilling technology after that?

JL: Well, we like to think that it did. We published a final report, which was several volumes when it was all through, and basically provided all the information and sources and references and so forth. So it was available to the industry.

Now, I did not follow closely all of the deepwater drilling out of that. I got involved in other parts of the marine industry, so I wasn't so much involved in drilling after that. I went back with Brown & Root and was working for offshore pipe laying, primarily. Then eventually this led into the marine equipment designs for Brown & Root. Of course, Brown & Root was a major offshore contractor, but we were not a drilling contractor. We were doing engineering and construction, offshore pipelines and offshore structures.

TP: So this was a whole new area for you, when you moved into the Mohole, the drilling engineering part of it.

JL: Yes.

TP: Did you consider maybe going in that direction with your career in drilling or—

JL: No, that didn't really grab me, the actual drilling operations. Now, I did enjoy the work that we did on the fatigue testing and full-scale testing. I thought this was quite interesting, and the aircraft industry was doing a lot of fatigue work at that time, if you recall. I think they even made a movie about it. There was a British aircraft that crashed that they traced down to fatigue at the corners of the windows. They didn't have circular windows in those days, they had square windows, and that stress concentration at the corners caused fatigue cracks and they grew. So there was a lot of interest in fatigue at that point in time.

TP: That probably came in handy, too, in the work you did on pipelining after that, right?

JL: Oh, yes, it was. Subsequent to that, the biggest part of the work I was involved in immediately after that and for several years, was in providing engineering services to our Marine Division. I was in Brown & Root's Engineering Department, just general engineering, which included pulp and paper and all kinds of disciplines. But after a few years, since we were concentrating on support of the Marine Equipment Division, which was—we had different divisions, had European and Gulf of Mexico and Southeast Asia and so forth. Since I was working with them so closely, finally took our engineering group and just transferred it to the Marine Department. So from there we had the naval architecture, and we were responsible for the design of the new offshore construction equipment, and pipe laying and pipe-laying analysis, and all this type of thing.

TP: I remember from the Brown & Root history your association mainly with the pipeline.

JL: Pipeline was where it got started, and I wound up, at the end what I was doing was I was in charge of the Marine Equipment Management Division, which meant primarily maintenance, maintenance scheduling for all of our fleet.

TP: That includes construction barges and pipeline barges and everything?

JL: Yes, everything. That was a challenge. I guess just being offshore was just kind of an outgrowth of starting out in the navy, and I liked that.

TP: Anything else you can remember about the Mohole, I guess that's what you're here for. I mean, I guess it was sort of controversial, you know, what's the science really for, I guess during the era of the mission to the moon and big ideas about exploration, both in space and ocean.

JL: Of course, this was nearly fifty years ago, so it's not all fresh in my mind. But there was a lot of politics involved, and, of course, the Brown brothers, George and Herman Brown, they had good friends in Washington, including Lyndon Johnson and Albert Thomas and so forth. So there was a lot of politics involved, and some people felt like Brown & Root was awarded the Mohole contract just because of political connections. I don't really think that was the case. I was too low on the totem pole to know what was going on then, but we submitted proposals for it and supposedly were selected on the basis of our proposals.

TP: You had the technical capacity to do it.

JL: Oh yes. Yes. We hired a great number of outside consultants. There were people all over the country involved in that project. We tried to

select people that were very knowledgeable in their fields and use them as consultants. As I said, we had Batelle, Southwest Research. We had an outfit out in California called National Engineering and Science Company, NESCO. They did a lot of work helping us with the analysis of the riser and drill string. We had university professors. There were several at Rice and University of Houston that consulted with us.

TP: Big science.

JL: Oh yes. There was quite a bit involved. But it was controversial because of the politics involved.

TP: The politics and also just, what's the purpose of this? Are they just drilling the mantle just to say that we can do it or is there really some application? There were a lot of applications for what you designed that were eventually incorporated into the offshore industry.

JL: Oh yes. A lot of it came out of that, but I think the fact that offshore drilling and offshore pipe laying are still going on, and I think if there hadn't been any sound basis for the project, a lot of the things that are going on now would not have continued. Somebody would finally say, "This is too much." But it's still being supported and they're still drilling in deep water and deeper water.

TP: Not going to end anytime soon.

JL: No, I don't see an end to it.

TP: I think this has been helpful. It's nice to get you to talk a little bit about your experience with Mohole. Is there anything else you want to add?

JL: In preparation for this, I was asked if I could recall any humorous incidents, and I couldn't really think of too many laughs along the way, but there was one that my wife reminded of. I was working offshore on a pipe-laying barge off the Louisiana coast, and being the klutz I am, I managed to sprain my ankle. I went and got in my rack and was going to spend the night there, but overnight it got quite swollen. So the decision was that I should go in and see a doctor.

I had a friend that was working in the Survey Department who had a car on the dock, and we managed to lower me into a boat and got to the dock, got in the car, driving up to Belle Chase, where our operations were. On the way we passed through a little town called Port Sulphur, and the driver, my friend Bob Rowe, who was driving the car, we came through the town and it was a red light and it changed to green, and the car in front

of us was going to turn left. And Bob was impatient, and he looked and didn't see anybody on the right, nobody in the rearview mirror, so he pulled around to the right and went on. We weren't too far down the road before the police pulled us over, and the local sheriff was telling us we'd violated the law by passing on the right. Bob said, "What's the deal?" And this sheriff—I don't know if you recall, back in those days Dodge automobiles had a commercial with a local sheriff in it who was kind of rough-talking and so forth, and Bob said, "Well, what's the deal?"

Sheriff said, "Ain't no deal, boy. You comin' to jail." So we followed them down to the jailhouse in Port Sulphur, and there would be a court hearing—this was on a Saturday, I guess, but it would be the following week. And in the meantime they wanted a $200 cash bond. Well, between us Bob and I didn't have $200 cash, and credit cards, all that, they didn't take those or checks or anything. So since we didn't have enough money to post the bond, Bob spent the night in jail, and I called the Belle Chase office and talked to somebody to come down, drive, pick me up, and take me back to the hospital. So I spent the night in the hospital, and he spent the night in jail. [laughter]

TP: For passing on the right.

JL: Yes.

TP: You've got to be careful down there in South Louisiana.

JL: Yes, sir. It was fun, though.

TP: Well, that's good. Why don't we conclude there. I'm sorry we didn't have much more time, but it's nice to get a chance to talk to you again.

[End of interview]