BOEM DEEPWATER GULF OF MEXICO HISTORY PROJECT

OFFSHORE ENERGY CENTER HALL OF FAME

Interviewee: James "Jim" Rike

Date: January 10, 2009

Place: Houston, Texas

Interviewer: Tyler Priest

Ethnographic preface: Jim Rike was born and raised in Malakoff, a small Texas town. His career began at Kilgore Junior College, from which he transferred into Texas A&M University. Rike only got through a few years at A&M before he was called up to serve in the U.S. Navy during the Second World War. There he served as an aviation electronics technician's mate. After the war, Rike completed his degree in electrical engineering and joined Humble Oil. By 1956, Rike had returned from a stint in West Texas back to the Houston area, where he continued his work at Humble on pipe engineering, helping to develop coiled tubing. Rike helped Humble secure multiple patents on downhole or well engineering practices. In 1970, Rike went on to found his own company as a consultant, Risk Services, primarily training the oil and gas workforce.

TP: This is an interview with Mr. J.L. Rike, Jim Rike, for the Offshore Energy Center Hall of Fame induction in 2009. The date is January 10, 2009, interviewer is Tyler Priest, and we're at the Westin Galleria in Houston, Texas. Let's start off. Tell us where you were born and where you grew up.

JR: Well, I was born in Malakoff, Texas. It's a little town over around east of Mahaya, so it's a small town. My father was a motion picture operator and manager, but he fell on hard times when the depression came along and so I was a depression baby. At that time, he was working wherever he could work. At one

time, he was a sharecropper, and at one time, he was a bootlegger, and that was necessary for us to operate at that time.

In terms of possibly why I'm in the oil industry, it might be because of that, because I hear all my friends, they want to retire to a little farm somewhere, but I learned all about farming that I ever want to know by being a sharecropper's son, and so I have no desire at all to go back to that kind of life. So I became very ambitious, wanting somehow to get a university degree and maybe be able to do something other than sharecrop farming, and so that probably motivated me a great deal.

I was lucky enough to have, I guess, a good mind that I inherited, because in those places where we lived in little, small farming towns, I was a bit ahead of the other farm kids, and so the teachers—we were oftentimes being taught three classes in one room. She'd teach one class and then another class and then another class. She found me paying more attention to the upper class than I was the class that I was actually in, and that I seemed to already know what was in the previous class. So that process took place in two of those places, and I skipped the fourth grade. The teacher wanted me to skip it, and I skipped the seventh grade.

So the end result, I graduated very young, but I had good grades. That didn't get me into university, though, or get me into anything else. I still struggled very hard, and it was only because of an oil man in Kilgore, Texas, that I was trying to get a job as an usher in one of his theaters, so that I could go to Kilgore Junior College, and he said he couldn't do that, because he had managers that hired the people, that he couldn't hire somebody and give him to one of the managers. But he said, "Do you want to go to Kilgore Junior College that bad?"

And I said, "Well, I want to go some way."

And he said, "Well, you go over and register and send the bill to me." And he never had met me before in his life, and that's how I went to Kilgore Junior College to start my career. It was an oil man. His name is Liggett Crim, C-r-i-m. There's a lot of properties that have his name on it in the East Texas field. So that started me in Kilgore Junior College. The next year, I did get a job as a projectionist in a theater and so I was able to pay my way, and barely enough to go down to A&M and enroll at A&M. Not enough to go very long, so I started asking how I could do better or earn more, and they said, "Well, do you tutor?"

And I said, "Well, I don't know what that is."

And they said, "Well, tutor means you help other students."

And I said, "Well, I help my sister sometimes."

So they said, "Well, we need somebody to tutor in math. Do you know math?"

And I said, "Oh, I love math." So I became a tutor to the football team at A&M, and so that paid about three times as much as all those other campus jobs, so that way I was able to earn enough to be able to—

TP: That wasn't when Bear Bryant was there, was it?

JR: Well, no, it wasn't when Bear Bryant was there. Actually, we were losing most of the time when I was there. But the end result is that then got me through part of A&M before I had to go into World War II. I had to enlist in the Navy.

TP: Oh, you did.

JR: So I went to the Navy and came back and then the G.I. Bill—

TP: Where did you serve in the Navy?

JR: When I served in the Navy, I was primary to going to school. They were training me to be an aviation electronics technician's mate. My eyesight wouldn't allow me to go to officers' candidate training or so forth, but I learned a lot about electronics at the time. The interesting thing about getting into the oil industry was that I liked math all my younger days, so I loved my math teachers and especially my university math teachers, so I decided I wanted to be a math teacher, until I found out what teachers were paid. When I found out what teachers were paid, I wondered if there was a better opportunity, and my calculus professor said, "Why don't you become an engineer." And I didn't even know what an engineer was at that time.

So he convinced me to go into electrical engineering, so I graduated in electrical engineering, and that was after the war was over, after World War II. Jobs were plentiful. Everybody was staffing up with people coming back from the war, and I had a lot of good offers because I had good grades. So at that time, the going rate for a graduate electrical engineer for an electrical company was, I think, oh, the range of offers I had was 315 a month, 325 a month, and 340 a month, I think. I think it was three offers that I had. So being a depression baby, I picked the 340 a month. That was the one that paid the most.

But before I actually reported, I was visiting down in Houston, saw the Humble Oil & Refining Company building and missed those interviews at school, so I thought, well, I don't have anything else to do, I'll go in. By the time I came out of the Humble Oil & Refining Company, I was working for Humble Oil & Refining Company. Some people, they say, "Well, what convinced you to do that? You were an electrical engineer."

And I said, "Well, after everybody talked to me and said, well, okay, they thought I could be an addition to the company, they kept talking about what I would do, and I kept sort of hinting I'd like to know what I was being paid, but they never would tell me, and finally the chief engineer said, 'Well, you'll roughneck and roustabout for a while, and so then when you become a junior engineer, we'll pay $365 a month.'" So I tell everybody I became a petroleum engineer for $25 a month, because they paid that much more than the electrical engineering offer that I had.

Now, that got me there, but I fell in love with—

TP: Where were you first stationed? Where'd you go first?

JR: Well, the first stations I went was roughnecking and roustabouting, and one of the roughneck jobs was around Teague, Teague, Texas, and the roustabouting was in Talco, north of Gladewater or Kilgore. So after that, they sent me to West Texas. They sent me to Odessa, and I spent, oh, about seven or eight years in Odessa, not in Odessa but in West Texas. I moved to places like Macamian [phonetic] and Hobbes [phonetic] and Denver City and all those great metropolises around where the oil fields are.

I learned to enjoy the oil people especially, and I fell in love with being an oil person as a result of that, and they moved me to Houston, and when they moved me to Houston, they put me in what they call a development group. Now, development group, nobody has them anymore, but at that time, that was some people in engineering that were supposed to be developing new ideas. Now, that sort of sounds like research to everybody, but we didn't do pure research. We were supposed to understand what people were doing and how to do it better, or was there a new gadget we could find maybe on the market or in some other industry, or if the researchers did come up with something new, then we made it practical. We carried it to the field and made it work on the job.

TP: In drilling, you were working on drilling solutions?

JR: I was working on completions and workovers in the development group that I was in. So it was in that particular area where most of my patents and my original work occurred.

TP: When did you move to Houston and work in this development group?

JR: Oh, it must have been in 1956 or something like that, about 1956, because I went to work for Humble Oil & Refining Company in 1948. So I spent several years in West Texas and then they moved me to Houston. So I was in Houston for seven or eight years and did this development work, and in the process developed techniques for doing any kind of well intervention that we want to do with one-inch pipe. This was useful because we didn't have to pull the tubing and the packers out of the hole, didn't have to take the crisper [phonetic] tree off. So we developed all the techniques for doing this with one-inch pipe, and this saved a great deal of money, especially offshore, because offshore the cost of rigs was a whole lot more expensive than it was on land.

So we developed all those techniques, and after we were doing all that and thinking about what to do, well, somebody almost jokingly said, "Well, you know, it would be a whole lot easier if we just had all this tubing wound up in a roll and just unreeled it in a way."

Everybody laughed and said, "Well, yeah, but that's not going to happen."

TP: You talk about well interventions. What kind of things were you doing with this one-inch pipe?

JR: Well, this one-inch pipe, well interventions include things like squeeze cementing to shut off one zone and then go through tubing and perforate another one. You can set patches with one-inch pipe if you have holes in tubing. If you need to spot some acid at a particular place before you pump it, you pump it through one-inch pipe. We used plastic to consolidate sand, keep it from flowing into the well, and we would pump this glue down the one-inch pipe fast and then could slowly pump it into the formation. So we could make all those techniques work and made them work with one-inch pipe. There weren't very many things that you needed to do to wells that we couldn't solve with one-inch pipe.

TP: Were other companies doing similar things, or was this idea really something that started with you?

JR: It started with us. I don't like to use the "you." I mean, I was always working with a group of colleagues. I was the head of the group, the development group, and so perhaps I get more credit, but I had some good people that were working for me and doing these things. So we developed them on the spot, and I guess prior to that with wire-line techniques, there was another company that was working competitively in the same area, and that was Gulf before they became a part of Chevron, Gulf Oil.

TP: Yes. They had a strong research arm, didn't they?

JR: Right. So these were novel ideas within the Humble Oil & Refining Company, and we made—we called it concentric tubing and made it useful all over the Gulf of Mexico, especially to make workovers and repairs of wells a whole lot less expensive. That then moved into the thought process of coiled tubing, of uncoiling pipe, and I decided that was worth working on, and begged and pleaded for a little bit of money to spend proving it feasible.

So we bought the only kind of one-inch pipe—3/4-inch, that was the only continuous-roll pipe you could get. We bought some of it and started bending it and straightened it and doing it as if the same kind of abuse we'd have in a well, and we found that we maybe could make that work. We wouldn't have to invent maybe a new pipe. So after doing that, we actually built a rig and went through all the safety precautions of how to make it safe, and then we built a rig and ran it in a test well for about eight months, and then we went offshore and did offshore workover with it for about a year, and that was one of the first coil-tubing rigs that was highly portable.

TP: How did the coil tubing work? You said people were suspicious that you could coil a tube down in the well.

JR: Well, a lot of people, when you would tell them about it, they would laugh and said, "That's silly, Jim. Anybody knows that if you bend and straighten pipe, it's going to break."

And I said, "Yes, but it's always after you bend and straighten it a certain number of times." So what made it work is simply finding out how many times could you bend and straighten it in this limited amount we were doing, before it would break. Then you would actually use it much less than that number of times and then retire it.

TP: What was the advantage of coiling it?

JR: The advantage of coiling it was you don't have any joints, and when you're making joints and putting the joints together, number one, that's where nearly everyone gets hurt on a rig in terms of accidents, but also it makes the well control a lot more difficult, because you intermittently have this pipe opening here every time you're piecing a tube together. If you have continuous pipe, you don't ever have anything but the end of it open, and now you reel the whole thing in, and the coil tubing at the other end goes to the hub, and you could actually be pumping through the hub and through the coil tubing all the time you're running and pulling it, so there's a whole lot of well safety involved in it, as well as personnel safety.

TP: And you would just retire the pipes before it had enough fatigue on it.

JR: Before it got to the point of breaking. Now, to make sure though that I don't hog credit there, at about the same time that we built this first rig, Chevron—and the chief engineer was Al Vitter, and he's one of the other honorees for this program. Al Vitter was the chief engineer with Chevron, and he had a young fellow named Bill Hanson, I believe, and they put together a much bigger one-inch pipe string with about a thirteen-foot hub, and they put together a coil-tubing rig, but it was big enough that it could only be put on a barge and was used for inland water, because it was a thirteen-foot hub and so you couldn't transport it, or without a big derrick barge you couldn't carry it offshore.

But it made a mountain of money for them, because they were spending a tremendous amount of money washing sand out of wells on inland water wells, and they had thousands of them in the South Louisiana marsh areas. So there was a tremendous number of barge locations that Chevron specifically had, and it was a very economic project or a very valuable project for them, even though that was the main purpose that they built it for. So the rigs that followed end up having, of course, some facets of their rig, as well as the facets of the first one we built, which they didn't look at all alike. They were both what we would call Model-Ts in terms of automobiles now.

TP: So you were working on this starting in the late fifties, is that right? You got your first patent on this—

JR: I think the first patent number on them was 1959, and the first rig got built, I believe, in 1961.

TP: And then did Humble start using this on all their offshore drilling?

JR: Well, one of the anecdotes which I like to share with everybody is that Humble Oil & Refining Company went through one of their reorganizations like these multinational companies do, you know, where they change the structure of the company. So I got wrapped up in the middle of doing this in one of these reorganizations and got moved to a particular region, and so that was when I was moved to New Orleans, to the New Orleans region. So it took me a year to get these new people in the region to let me work again on this coil tubing. It was something I was working with over here, and so to get me to work back with the coil tubing, because I thought it had a great idea, but they wanted to do workovers and squeeze water and do other things.

But the reason I think people think it's interesting was that at about that time, I discovered that Chevron was building that string of pipe in a yard out in Metairie, were putting the pipe together. So I went over with a camera and took a bunch of shots of what they were doing, and carried it back and showed it to my bosses, and I said, "Do we want to let Chevron get ahead of us here?" And that was how I got them off base and letting me work back in the coil tubing and go ahead and get a rig built of the kind that we were working on.

TP: What was the name of the first rig that you did the coil tubing?

JR: The first rig?

TP: Yes. Do you remember its name?

JR: I don't know that we put a name on it. Brown Oil Tool built it. We made a contract with Brown Oil Tool. They made the drawings and constructed it, and they operated it with us owning it. We were half owners for about a year, and after a year, Humble Oil & Refining Company did not want to be in the rig business. That wanted that to be a contract. So Humble sold our interest to Brown Oil Tool, and Brown Oil Tool then marketed the coil-tubing concept with a new company called Best, B-e-s-t, Brown Equipment and Service Tools, or something like that, and so that was the company then that carried it forward after we did the original development work and the original test work.

And that's the reason for the Brown people, Cicero Brown, he was sort of the mastermind behind all of the novel things that Brown Oil Tool did, and Joe Brown, the other fellow that I mentioned giving credit here, Joe was president of Brown Oil Tool at the time that they built the rig, and so I was working closely with Cicero Brown and Joe Brown in building that first rig and making it field worthy and finding out what was wrong and changing it and so forth.

TP: Yes. They're listed on the citation here, too. Okay. So it wasn't something that Humble kept to itself. It then became diffused through the industry, the use of this.

JR: Oh, yes, yes. The patent position—there were lots of patents issued, but the patents were not very broad, because in applying for a broad patent, the Patent Office cited the PLUTO concept in World War II. PLUTO is Pipelines Under The Ocean. That was the name given to making all those lines across the English Channel to be able to get diesel oil and gasoline across once we reinvaded Europe. They needed to have some way to fuel it, and so they coiled up pipe, plugged the ends and it would float, and then they'd wait till they had a moonless night, and then they would hook it over on the British side and then push the barge during the dead of the dark night over to the French side. So there were twenty-three lines laid that way, in order to furnish fuel for the Allied invasion.

TP: So the Patent Office cited that as a constraining factor.

JR: They cited that as prior. I thought that was quite unfair, because that had little or nothing to do with doing it in a well and hanging it vertically, but they're the masters of those decisions.

TP: Yes, wow. So are all these patents sort of related to coil-tubing technology [unclear]?

JR: No, the patents virtually all have to do with completions and workovers.

TP: Okay, I see.

JR: Because they came about during that period in which I was head of a development group, and we were thinking up different ways of intervening in wells and doing it better or cheaper, and that's what most of my patents are about.

TP: Can you talk about some of the other innovations, as far as completion technology goes?

JR: Well, one of the innovations is squeeze cementing. We learned to do it with low pressure in small amounts, whereas the industry prior to that and oftentimes still uses 400 or 500 sacks. Well, we could do a squeeze-cement job with twenty-five sacks, could seal off something and could do it with one-inch pipe or sometimes with a bailer, and not have to have the big rig on a well. We made some innovations in controlling sand. These plastic—I call them glue jobs, because that's what they were. They were dilute glue that you pump down and glue the sand grains together a little bit better where they touch, and now, then they don't

come loose when they come through. So that's one of the several of the patents that are there.

Some of the patents have to do with aiming guns. Once we came to the idea that we'd like to put two strings of pipe parallel in the same well bore, and why would we do that? Well, to produce two zones. Now, we've done that before. We do that with packers inside of casing. But it's a lot cheaper if you had just two strings of casing and let them go parallel, and then complete one in one zone and another one in another zone, and you've got two completely independent wells using the same bore hole. But you have to be able to aim the gun, and you have to be able to aim the gun when it's down two miles in the ground and you're up here. So one of the patents or a couple of the patents relate to aiming a perforating gun, you know, after you get it in place, to be able to shoot in a safe direction, so that you don't shoot holes over in the other string, and so that's another one of the innovations. It's actually used a great deal, apparently.

TP: And you were doing all this work in New Orleans at the time?

JR: I did most all of those innovative things. They were part of that development group when I was in—

TP: What was the group called?

JR: That's what we called it, a development group. It was an engineering development group, and so it didn't have any title other than that at that time, and I don't believe any oil company has ever quite organized themselves that way. But at that time, Humble Oil & Refining Company had a large cadre of engineers in the headquarters office, and the reason for the large cadre of engineers was because they had these development groups, one in completion workovers. They had one in drilling, they had one in surface facilities. They had development groups that were engineers trying to find practical new ways of doing things, and nearly everyone, all of the other companies before and since, kind of say that's research. They call that applied research, and they attach that to the research organization. But Humble Oil & Refining Company at that time had those groups as a part of their engineering, and their research people were more laboratory people. They came up with new ideas of a laboratory type or an equation type.

TP: Companies are always wrestling with the pure research or the theoretical research and how do you make it work for the commercial organization, so there was always the applied group.

JR: We were the ones who would make it commercial, would make it work even after they came up with the idea, and so we worked very closely with the research people when we were using one of their new developments and trying to make it work in the field.

You like anecdotes. One of my favorite then with respect to some of that was, they actually originally developed the glue, the glue to help glue the sand together. But the glue is exothermic, meaning when you put the ingredients together, it gets hot, and if it gets hot it means it sets pretty fast. So in order to be able to use it, we had to figure out some way to slow it down. Otherwise, it sets before we get it down where we need it. So being brilliant young engineers like we were, we said, "Well, we'll put all the ingredients in a refrigerator truck overnight and cool them down to near freezing." And we made that work. So that worked, but that worked on land, because you could maybe carry a refrigerator truck out to a land well, but it's not very easy to carry a refrigerator truck out to an offshore location.

So we started brainstorming, and so we said, "Well, okay. Let's get some dry ice." So we got some dry ice, and now then we could bring some dry ice out, and you could put it in cardboard containers and it'll stay pretty good shape for several days. But then whenever you need it, well, you break it up into pieces sort of like ice cubes, and then put it in and it'll cool the fluid down to near freezing, and now then you could pump it and you had enough time. Well, one of the times after we'd done some of that experimentally offshore, I'd been in for several weeks from doing that job, and I got a telephone call from the manager offshore, and he insisted that I get on a plane and come over there right now.

So I did. I walked into his office and he said, "Don't slow down. Go to the helipad. We'll have a helicopter warmed up to take you out to what I want to show you." So I was worried to death. I didn't know what he was going to show me. So I got in a helicopter, we went out to that platform where we'd done this job with this dry ice and this plastic. A civil engineer was there, and he carried me over, and they have these great big I-beams that we use to skid the rigs on. That's what the rig rests on is these skid beams. He carried me over to one of these I-beams, and it had a great, big, wide crack, jagged crack across the I-beam. What we concluded is that somebody had taken one of these slabs of dry ice, which is minus 283 degrees, and had laid it on that skid beam and forgotten about it, and that tremendous cold simply cracked that skid beam. And so they took up my passport to go offshore for about six months at that time. I wasn't very welcome out there.

TP: Wow. So what kind of solution did you come up with for this hot glue, for working offshore?

JR: It still worked. We just had to learn to not use the skid beams, you know, to leave it on it.

TP: As a tabletop for the dry ice.

JR: Right. We used them still to break it up, but you put it in a tow sack or something and hit it with a hammer. You don't leave it there. It's leaving it there in a slab that had caused the crack.

TP: Oh, that's funny. There's a whole list of things you've got here. I guess you've talked about quite a few of them. You stayed with Humble for—

JR: I was with them for twenty-two years.

TP: So you started in—

JR: 1948, and I resigned in 1970. I was in New Orleans at the time, and quite frankly, I was just restless. They were treating me very well. I had no complaints, and they didn't have any complaint about me that I knew of at least. But I was just restless and thought that I could maybe do something more interesting by going out and being a consultant. I did do my first training with them, with Humble Oil & Refining Company, and I won the Oscar, they call it, at all the training schools, because when the students would grade the instructors, they always gave me the highest grade, so I became the favorite instructor. Well, part of that is because I enjoyed doing it, so I had fun with them while I was teaching them, and that's the reason they liked it, so we learned more.

So when I became a consultant, I had that background and I said, "Well, hey, why don't I use that? Since I seem to be pretty good, why don't I offer training as a consultant?" So that was in 1970, and the big boom started in 1973, so in 1973 there was tremendous demand for training people, for getting more and more people ready, so my training business multiplied and grew much faster than the consulting did. So that is the reason why I'm primarily a training company, or have been. As a consulting company, probably 75 or 80 percent of our work is training, is training courses, and we do it all over the world.

TP: Training courses mainly for individual companies, or do it through the SPE, or both?

JR: Well, we do some of all of it. We have trained through PTEX, these industry-wide things. We have sometimes taken part in some company schools, but we offer public schools of our own, or we have offered. For instance, I'll go to Dallas here in the week after next, and I'll teach a public seminar in Dallas on artificial lift methods. But we have those public courses, but then for many years we've done what we call in-house courses, where Exxon or Mobil or Chevron wants us to come and do a tailored course to twenty-five of their people, and they'd like this agenda. We call that an in-house course, where we tailor it to the group of people they assemble and to whatever they want.

TP: They want a range of workover completion technologies, or just a range of different things?

JR: Well, we offer everything upstream. In other words, everything from seismic work, geology, and all the way to the refinery. I personally, though, I know a

little bit about all those things, but not enough to want to put myself in front of people as a teacher, and so I keep up with completion-workover things, because that's what I've spent my career, that and artificial lift. So personally I teach in those areas, and I have associates that then teach the drillers and the surface facilities and the reservoir engineers and the geologists and the other courses.

TP: Explain for someone who doesn't know, what artificial lift means.

JR: Artificial lift is something we put on a well in order to make the oil, or gas in some cases, come from the bottom to the top when there's not enough pressure or not enough energy in the well itself to cause it to flow to the top.

TP: That's not the same thing as enhanced recovery, is it?

JR: No, it's quite different. Enhanced recovery is a system of usually a chemical or physiochemical, putting something down that will make the rock turn loose of more oil or gas.

TP: This is strictly in the well?

JR: This artificial lift is just a way to get it from the bottom of the well to the top, up here where we can use it and sell it. So there are about, oh, eight or ten different artificial lift systems. Anymore they're not just used when it won't flow. We use them to make a flowing well produce more. In other words, instead of just allowing it to flow a little trickle, okay, add an artificial lift system, and now you can get a much bigger well instead of a little trickle.

TP: How much can you increase productivity in a well using artificial lift? It probably depends on where—

JR: Right, it depends on the well. The well itself is the limiting factor. Some wells are good enough in terms of their permeability, that even though they won't produce at all, we put them on artificial lift and we make several hundred barrels a day, or several thousand barrels a day. But other wells that are from tighter pay zones, we may not be able to get but twenty barrels a day. So we can lift it any faster than it will come in at the bottom of the well, so that's the limit is how fast will it come in at the bottom of the well? The artificial lift system is a way to lower the pressure as low as you can get it at the bottom of the well, so that you get the maximum difference pulling fluid into the bottom of the well and then taking it and moving it to the top of the well.

TP: How long have these techniques been around?

JR: They've been around almost since the oil industry started.

TP: So it's an old method.

JR: Because the first oil wells, everybody knows them as being gushers. But the gushers don't last very long, and immediately as people started looking, they found places where they would run into the oil, but it wouldn't flow to the top. So the easiest form of artificial lift is just a pump, ordinary plunger pump that goes up and down, and we put a string of rods up here, and then we let these rods lift these rods up and down, and it pumps it down here. So that was the first artificial lift system.

Well, we've now developed ten or twelve others, different ones, but it's fundamentally a pump mechanism that you put down there low in the well where the oil is coming in, and then use the pump to lift it or to get it to the top.

TP: Okay. So you've been in business, Rike Service, for about thirty years, is that right?

JR: It's almost forty now, because I resigned and became a consultant in 1970.

TP: And you're still active?

JR: I am. I'm not as physically agile, and because of that I have—when I say because of that, I mean I have only one eye and I use a crutch because of my arthritis, but it hasn't hurt my mental capacity yet, so I'm able to still do training, and so most of my personal activity is in the training side, or when I do consulting work, it's in an advisory capacity, or I do a good bit of expert-witness work, you know, the court cases where somebody gets and expert for their side of the case. So most of my consulting work is of an advisory or category like that, since I can't go to the rigs and do many things physically anymore. It isn't that I don't go to the rigs, but if I do, I stand out to the side and I say, "Why don't you look at this." and, "How about checking this." I don't climb the stairs and do the things that other consultants do.

TP: Well, you have a vast amount of knowledge that people still draw on.

JR: Well, they apparently think so, and as long as they think so I guess that's all that's important.

TP: I see that you're a distinguished member of the SPE, honorary member, the highest award by the SPE.

JR: Yes. Two years ago they made me an honorary member, and that's the one that they only give to one-tenth of 1 percent of the membership, but it's the highest award they have, and I feel very honored to be there.

TP: You've been involved with them for a long time. Well, it's been a remarkable career. Can you think of anything else you'd like to add, any other stories?

JR: Well, being a teacher, I don't run dry. I can last as long as you like almost. Actually, people often ask me, what is the most enjoyable part of my career in the industry, and I find it is the mentoring. Everybody tends to say, "Well, okay, there's inventing new things like coil tubing and things like that. Isn't that really exciting?" It's exciting later, because after it works and everybody puts you on a glory path and all these compliments, but actually during the time, it's frustrating, because everything has bugs in it. You have to work the bugs out, and it's frustrating, because you're trying something and it didn't work, and so you've got to figure out how to correct that particular problem.

TP: There's more immediate payoff when you're teaching.

JR: Well, yes, but in teaching, at least if you do a good job of it, you see the light bulbs come on in people's heads. But aside from just teaching, when I was in the corporation, I used to very much enjoy having young engineers under my bailiwick and helping guide them and head them in the right direction, and I've been highly complimented by several people who've become executives. Indeed, one of the executives in the offshore group here, Mark Childers, he considers me one of the best mentors that he had when he was a young engineer, that got him excited about the industry, and I have more pride in things like that than I do sometimes in these technology accomplishments, the fact that I helped somebody get their sea legs or get excited and then become successful in the industry. That's a point of great pride with me.

TP: Now, I see that going back to the in-house training that you do, not just for the major oil companies and private oil companies, but also a lot of the state-owned oil companies around the world it looks like, too.

JR: I've probably done some training in probably every country that has any significant oil or gas production, and nearly all of those are national oil companies. Now, some of them aren't, because Australia has a bunch of independent—they don't have a national oil company, but most of the others are national oil companies. That's a challenge in itself, because sometimes those people aren't as motivated as we are. Sometimes they are training them because they're using the oil industry for political purposes, in other words to provide jobs, and so, okay, it's nice to train these people so they can maybe do something better. But if these people aren't there because they're just dying to find out more, they've got a good job and so somebody told them to be there.

TP: They're just sitting on production.

JR: Well, right. So they're not as highly motivated, they don't enter in. Now, that's not always the case. I've taught some national oil company people in which they were very enthusiastic, and they pressed me hard for questions and were genuinely concerned about making their national oil company the best in the business, but it's a different thing.

TP: Petrobras is certainly one of those, I would think.

JR: It is. Indeed, when I went to Petrobras, that was one of the companies that was very, very strongly oriented, and they came at me with, I call it tooth and nail, testing me. When I would tell them about certain things, they'd want me to prove it and want to know what background I had. They're a very motivated group in Petrobras.

TP: I guess it's been a while since you have done any work offshore. I mean, you've mainly been consulting and training. But since this is the Offshore Technology Conference, do you have any stories or memories about going offshore, working offshore?

JR: Well, there are a great number of them, and I still do work offshore, but when I say I do work offshore, again it's advisory work. I just don't physically go. So I was involved in a court case for an offshore coil-tubing rig that had a gross failure. But you're looking at the facts and the engineering. Someone else is collecting the data, and so I'm offering the expertise, and so I know a lot about offshore, because I was working offshore for a large—oh, probably 50 percent of the time when I was active, I was doing it offshore. So when we were doing development work, we were always eager to go offshore, because that's where it would pay off handsomely. Anyway you could save money, if you can save a little money on land, you save a mountain of money if you can make it work offshore.

So one of the things that people tell stories about me is my first trip offshore, I was the typical young engineer. I also wasn't a big athlete. I've never had great eyesight, so I wasn't a football player or baseball player or the like.

TP: But you tutored all the football players.

JR: Yes, I did. Right. But at that time, well, if you went offshore and you rode the boat, you got off the boat by grabbing a swing rope. So this swing rope comes over, and I'd never done that. I was just going out there for the first time. Nobody gave me an instruction. When we got there, well, the guy that was with me, he said, "Jim," he said, "when the boat comes up, you catch the rope when it's up, and then the boat will swing out, and then you swing over to the platform deck over there." Looked easy. All the other guys were doing it.

And so I said, "Okay. I think I understand that." So I got up there on the bow, and I caught the rope, and when it got up to the top of the swell, I caught the

rope and I swung, but I forgot to let go when I got over there, and so I came back and fell in the water. [laughs] So I got my baptism, you know, right early.

TP: How many stories I've heard about swinging over from crew boats onto the platform. I would not want to do that.

JR: Well, once you do it a few times, it's the easiest thing in the world. But that first time, all your senses are just hanging on, and it's also the first time you're on that basket. When I first saw that basket, I thought, well, that's not bad. I'll get inside there, and they'll just set me down. They said, "No, you don't get inside, Jim. You stand on the ring out here, and you just hold onto the rope." Well, that means you can fall.

TP: We interviewed the guy who invented that.

JR: Did you? Did you really?

TP: Billy Pew [phonetic]. I don't know if you've heard of him.

JR: Really? All right. Well, that's a wonderful gadget, and as I said, I wouldn't take anything for it, and if you do it with the right kind of precautions, it's not an unsafe gadget. It's when people get silly or act like cowboys and want to jump or do something like that—

TP: Or when you're trying to do it in really rough weather.

JR: Well, in rough weather it is difficult, yes, in rough weather. So my trips offshore had the usual run of those kind of learning places. Other trips offshore sometimes were interesting, because the people who are operating, say, a platform or a series of wells, their objective, of course, is different from an engineer that's trying to make a new process work, as you can well imagine.

So the coil-tubing unit, one of my favorite stories with it was that, okay, they agreed to take it offshore for a year, and, yes, we made money with it. But, of course, we also had problems with it, because it was a new gadget and it had things that failed or we had to redo. So at the end of a six-month period or so, I decided I needed to bring it in to make some revisions that needed to be done in the shop. So I went to the key people that I had done some work for, and one in particular, I went to him and I said, "John," his name's not John, but I said, "John, what do you think I ought to do with the coil-tubing rig?" He knew that I was bringing it in.

And his answer was, he says, "Jim, I think it'll make a damn good boat anchor," because a couple of his wells had been involved, and some of those were where we had a problem, and we had a mistake that we had to correct, and so that's what welled up in his mind was the number of mistakes that it had. So the

fact that it had made money overall just didn't matter. His two wells were a disappointment to it.

So that's kind of the character of development work. While you're doing it, you're in sort of a hard sell position to keep everybody enthused about it when it has problems. Now, once all the bugs are out, well, everything's fine.

TP: Translating from the drawing board to the field is—

JR: Right. But everything has to go through that business, and aside from the technical side of it that you have to revise, there's the learning curve of learning how to use it and learning how to use it correctly. All of that is sort of a struggle, and you can't do it without some mistakes or without some failures.

TP: Well, you're devising the proper safety procedures for a lot of this stuff.

JR: Well, we never hurt anybody. We always took care of that. But the other things, some of them are funny, some of them are ironic. For instance, the business of aiming a gun. I figured out a way to aim the perforating gun after it was down in the well, and the technology was fairly simple. You take a thing that measures density, and we have logs that measure density. So what you do is you wrap lead around this density tube, because it's a radioactive instrument, except you leave about a 15 degree window open, and so now it's measuring the density it sees only outside this 15 degree window. So now if you turn it 360 degrees, it measures the density it sees as it rotates. So, okay, when it's looking at this other string of pipe, it's higher density, and when it's not looking at the other string of pipe, it's lower density, not rocket science, fairly basic.

So we made the tool to go out there and do that, and we did it successfully on several in-shore wells, but I wanted to go offshore as usual, because that's where it would make the most money. So they finally let me take it offshore. We put it in this well, and we figured out a procedure for determining whether we shot into the other string. The procedure was to pressure up the other string, because it didn't have any holes in it, and if you shot into it, of course, the pressure would bleed off. So we oriented it, and I found where the high density was, and I aimed everything in the other direction, and we fired the gun, and the pressure bled off in that other string immediately, which said I shot a hole right in that other string. So I had to somehow come in to these field people and say, "Something went wrong."

And they said, "Yes, and what in the world are you going to do about it?" I figured out a way to get past that, and they said, "Well, have we got to go back and redo the thing?"

I said, "No. I believe I know why we did it." Then I said, "I'm ready to go back out and do it now." This was, there were three strings parallel, "I think I know what was wrong, and it won't happen again."

"All right. Better not," they said. So I go back out and we go through the aiming job again, and I shoot a hole into the other string. So I tied all three strings together, and again they took up my passport to go offshore for a while.

Well, what was wrong? The thing that was wrong, there was a mark whenever you were assembling the guns, and the marks were supposed to be lined up so that, of course, the radioactive—the window was aimed in this direction, and the charges are aimed in this direction, and the guy that assembled it had assembled it in the opposite direction. So I was doing a perfect job of aiming it right at the string, just shooting a hole in it.

Well, the second part of it is equally amusing, because we said, "Well, we can't have that happen. What are we going to do?" So we'd think and we'd think, and we'd say, "All right, let's fix it this way. We need to fix it so it can't be assembled in the wrong way, so instead of fixing it with four set screws at 90-degree angles," which is what we had, which would allow you to put it wrong, "we will put these holes, and these set screws, we will make them at odd positions. We'll make them at not even place, but they'll be at odd numbers of degrees around the [unclear], so that there's only one way that the four holes will align, and that will make sure that it cannot be put together incorrectly." And so we were very proud of how smart we were.

So I went out on the next job with them to do this next perforating job—

TP: After you got your passport back.

JR: After I got my passport back, yes. They were assembling all the guns and so forth, and I was doing some checking of the electronics, and I heard one of these service company hands talk to another, and he said, "Hey, hey, bear! Hey, bear, bring a drill over here. They didn't drill these holes in the right place." He was about to—it didn't line up. He was going to drill the holes in the right place so it would be assembled.

I said, "Wait a minute! Wait a minute!"

TP: Outsmarting yourself again.

JR: Yes. So what he says is that, "If you think you can make something foolproof, they'll always invent a bigger fool." That's the lesson point about it. But those are the things that go with trying to build something new and different, and people, you know, they just don't think in terms of anything being put together with odd spacing of holes. Somebody made a mistake in doing that. It surely wasn't intentional.

TP: Well, we should probably wrap it up, we've got one more interview to do. But I appreciate your time, and I want to congratulate you again for being honored in the Hall of Fame. It's a pleasure talking to you.

JR: Well, thank you very much. I consider this another pinnacle. I mean, I thought I had gotten it all when the Society of Petroleum Engineers made me an honorary member, but I had never thought of being called a pioneer, but if the offshore group feels that I'm a pioneer, I'm very proud to take my place among it.

TP: Well, there's broad consensus of your being inducted, so that's great.

JR: Well, I enjoyed the offshore operations. That's always where the big excitement is. That's always where the fun is, but it's also where the big money is, and so I'll always be beholden to my offshore friends and the people that taught me the things that I know and that I worked with offshore. They're the golden people of the oil field, as far as I'm concerned also. So thank you very much.

[End of interview]