Interviewee: Richard "Dick" Frisbie
Interview: October 10, 2009

BOEM DEEPWATER GULF OF MEXICO HISTORY PROJECT

OFFSHORE ENERGY CENTER HALL OF FAME

Interviewee:	Richard "Dick" Frisbie
Date:	October 10, 2009
Place:	Houston, Texas
Interviewer:	Tyler Priest
Ethnographic preface:	Dick Frisbie was born in California but grew up in South Africa. He attended Virginia Tech, gaining a degree in mechanical engineering before working for Pratt & Whitney for three years. After several years in the U.S. Army, including time spent in-country during the Vietnam War, Frisbee returned stateside. At Old Dominion University, he earned a master's degree in physical oceanography. He took on with a firm called Ocean Systems, based near Washington, D.C., working as a diving systems engineer. There, Frisbie was involved in some of the very first industrial uses of remotely operated vehicles (ROVs) for both general offshore and marine petroleum uses. Frisbie stayed with Ocean Systems as the firm became part of Oceaneering in 1984 after an acquisition; by then Frisbie had become general manager for ROVs. Frisbie continued to work for Oceaneering for decades, in a multitude of roles.

File 1

TP: This is an interview with Mr. Dick Frisbie. My name is Tyler Priest. It's October 10, 2009. This is for the Offshore Energy Center Hall of Fame induction for 2009.

Let's just start off with a little background. Where are you from, where did you go to school, and how did you get involved in this whole business?

DF: I was born in California. My dad was a mining engineer, and I actually grew up in Africa. I lived in southern Africa from the time I was three until I came to university in the States.

TP: I noticed you spent fourteen years in Africa. I wondered if that was part of your career, but it was when you were younger.

DF: It was while I was growing up. I actually went all my schooling in Africa up through university. I graduated from Virginia Tech with a degree in mechanical engineering, then went to work for Pratt & Whitney Aircraft in their Marine Division. They were beginning to put gas turbines in their naval vessels at the time, so I worked in that group for three years. Then I spent four years in the army, and after I served, I went back and got a Master's degree in physical oceanography.

TP: Did you serve in Vietnam?

DF: I spent a year in Germany and then a year in Vietnam. That was a pretty tense time.

TP: It sounds like as if you were flying a helicopter attack squadron.

DF: I was attached to a helicopter attack squadron and then I was in charge of the ammunition department at Long Bay. It was a long time ago.

TP: How long were you there?

DF: I was there for thirteen months.

TP: One tour.

DF: That was enough. It was time to go do something else. They asked me if I wanted to stay; I said, "No, thank you. I think I'll move on."

TP: So then you came back to Virginia, is that right?

DF: I came back and then went to Old Dominion University and got a Master's degree in physical oceanography. Then I joined a company in Reston, Virginia.

TP: What drew you to physical oceanography?

DF: I have always been fascinated by the ocean. Actually, when I was at Virginia Tech, I was in the Marine Engineering and Naval Architecture program. But they changed the title my senior year, so I actually graduated with what they call a mechanical engineering degree, but I've always been interested in ships and the ocean and stuff like that.

I had no intention of going into the offshore industry. I'd never thought about it, but when I was beginning to look for a job, I looked around and a company up in Reston called Ocean Systems made me an offer, which is always a good reason to select any company, I suppose. So I went up there and started off as a diving systems engineer, designing and installing diving systems on vessels around the world.

TP: Not just for the offshore industry?

DF: No, that was for the offshore. They were really a diving company that did some navy diving, but three or four years before had decided to switch over to the offshore industry for their subsea services.

TP: From there, you started working on diving systems, meaning submersible chambers and things like that, right?

DF: Yes. Really design, actually. We had them manufactured, and then we would outfit them and go install them and lease them out to the oil companies with divers and stuff. But I was never a commercial diver. Scuba diving, that was as exciting as I wanted to get.

TP: Do you still scuba dive?

DF: I still scuba dive, mainly because my daughters insist on it.

TP: So take us through some of your achievements in diving systems and how you got involved with the whole ROV technology.

DF: On the diving side, I guess the one thing I did is I designed the industry's first 1500-foot diving system, which wasn't much, because then someone

designed a 2000-foot diving system. I did that for three years, and literally I was sitting in my office one day, and the president, Jerry Jones, comes down and he says, "Dick, what do you know about ROVs?"

And I said, "Never met her in my life."

He said, "This is a serious conversation." Jerry, though, sometimes was not. So he then he said, "Well, I bought five of them."

I said, "Well, what are they?"

He said, "Remotely-operated vehicles."

I said, "Okay."

He says, "Go to—," I thought he said Hell Cajon, but actually he said El Cajon in California, because we had thirty days to cancel the order. So I had to find out where El Cajon was, which is just east of San Diego.

So I went out there and spent longer than I'd like to think, sort of getting the first one built. At that time I really began to see the potential of them. When I went out there, I literally had no idea what an ROV was. So these people talk about planning career paths; that never happened to me. But it became obvious, first thing, having come from a diving side, I knew that 1,000 feet was as deep as we were going with manned diving. There are manned submersibles that can go deeper, but it just slowly dawned on me. It was more of a gradual recognition that if you can make these things work and make then do something, then you sort of had an unlimited capability which would be as good as you made the system.

TP: Is this is about the mid-1970s?

DF: This was '77. This was really early.

TP: This is when the companies were looking at one thousand-foot platforms.

DF: Right. Cognac went in a little bit later and it used the RCV 225s to support the divers. At that time almost all the ROVs were what we would call inspection ROVs, little eyeballs, and they were used to inspect and also for diver support. That was really a big difference once everyone got used to it because it became a safety system as well. You could see if there was a problem developing somewhat. Cognac was just a remarkable feat, when you think about the state of the art.

TP: Did you work on Cognac at all?

DF: No, I didn't. One of the other inductees, Drew Shell [phonetic], that's where he got his start. In fact, he worked for Jerry Jones before Jerry Jones left Taylor and came to Ocean Systems.

The equipment we were dealing with was a company called AMETEK Straza, and they had built what they called Scorpio, which is a work-class ROV. The idea was they could have a manipulator and carry a little bit of payload. So our first experience with Scorpio wasn't particularly good.

AMETEK was a big company, their real customer was the U.S. Navy. They built very sophisticated sonars which were out on submarines and surface vessels. They were just geared to a different market. We would have a lot of trouble if we saw a need to get something changed, even something minor. It just couldn't happen.

We actually took the first Scorpio we had to Taiwan and were hired to harvest coral. I guess that I'm probably one of the first persons to have lost an ROV, so whenever one of our supervisors phones up and we find out we've lost an ROV, I come to realize it's no longer the end of the world.

We just didn't feel that we were compatible with AMETEK Straza. That says nothing about either company, because there were sixty or seventy Scorpios built. The Scorpion became one of the baseline work-class ROVs of the world for a long period of time, but we just didn't get along with AMETEK for whatever reason.

So we went up to Canada, and there was a company, International Submarine Engineering, and we sort of cast our lot with them for a number of years with the ROVs that they were building at the time. It was a good relationship. They were very small, so you felt you had some impact on them, and they had three or four customers from the oil and gas patch. They were beginning to understand what we were trying to do, as opposed to a company that maybe came out of the aerospace or defense thing that just had a different vision as to how things work.

TP: So you were buying ROVs, hiring them to be built, and then leasing them out to oil companies?

DF: We would purchase an ROV and we would actually go up and help them assemble it, mainly to train our people, because there was no training at

the time. Then we would day-rate it out to the oil companies on their drilling rigs and stuff like that.

The industry gradually started going deeper. We put a lot of ROVs on what we call shallow rigs today; 300, 400, 500 feet. But we were touching up against 1,000 feet and it just became obvious that we were going to go deeper. No one knew when and no one exactly knew how, so we really committed to ROVs.

I think the other reason that Ocean Systems committed to ROVs is that we were competing with very significant diving companies. You had Taylor Diving. You had a company called Oceaneering International, which really dominated drill rig diving at the time. They had not only diving capability, they had also developed the JIM and the WASP and stuff, and we just didn't feel that we could compete on an equal basis with those companies that had really established customer relationships.

TP: You had divers, though?

DF: We had divers, but Ocean Systems, really, if you look at their history, developed much of the technology that you see in the diving industry today. They were always driven by a navy mentality; for many years they were run by ex-navy people and they viewed military diving as being the place where the company would really make its mark. It turned out that that just wasn't what happened; commercial diving went exponential while military diving flattened or it actually went down. The navy started just borrowing all the technology from the commercial diving industry.

So we came from a company that had commercial diving but really was competing against much larger and more established companies. I don't know if it was exactly a conscious effort, but we began to believe that the future of our company's growth was going to be in remotely operated vehicles, and that turned out to be the case. I think the watershed came in '83 when Shell was going to go off the East Coast and drilling in the Baltimore Canyon in 6,000-plus feet of water. They went out to contract. In fact, Howard Shatto—who's another individual you should interview—that's where I first met Howard and Carl Wickizer and Gordon Sterling. They were bidding for the ROV system.

Howard could probably tell you how many companies they bid against. His view of that's probably a little bit different than mine. I can remember that somewhere during the process, they came back and asked us for a last and final bid, a best and final offer. We had no idea what that meant. We found out later that's a government term which means you're supposed to

drop your price again. So I said, "Well, you've got our best. You've got our only offer, Howard."

TP: Priced to sell, right?

DF: They kept coming back to us on that and we kept not responding, because we really didn't understand that was part of the process. They were bidding to a company called Eastport International, and Eastport, I guess, kept asking, "When is this best and final offer coming up?" So Shell said, "Well, that sounds like a good idea. We'll use that." But the fact is that we had no idea what they were talking about. So after we got the job, it was interesting.

TP: It was for the drilling in the Baltimore Canyon.

DF: It was for the *Discoverer Seven Seas*. We went back to Howard and I said, "Well, in the end, Howard, how did you select us?"

He said, "Well, when we kept asking you for your best and final offers, you guys just seemed to know exactly what you were doing. You never changed. Everyone else kept changing. And we thought that was good."

I said, "Howard, we didn't know what the question was." [laughter]

That was remarkable. I mean, there had been some ROV drill support at 1300, 1400 feet. Prior to that, the *Discoverer Seven Seas* had a *Pisces 5* submersible on it. It had drilled in about 7,000 feet over in the European sector. It was one of the bidders, but Shell just recognized that putting a submarine in the water and not really knowing exactly what's going on till people get back to you, and then you have to recover from that, when you looked at the future, that wasn't the way to go. That really was going to be a very complicated endeavor.

TP: Submarine meaning manned.

DF: Manned submarine. It was a two-man submarine. *Pisces* is a very famous submarine, even in our business. So they made the commitment to go with a remotely operated vehicle, which was a pretty bold decision since it had never been done that deep. The East Coast in the winter is a pretty tough area, and really throwing their lot in with a technology that had never been half as deep was too risky. At the time, the only ROVs that had been that deep, as I said, were just a few in the telecommunications industry for AT&T long lines that was inspecting some of their

telecommunications cable work. They had been down 4,000 or 5,000 feet, but only for very limited applications.

TP: This is a really important date.

DF: In my mind, the *Discoverer Seven Seas* and what we built, the *Hydra 2500,* was a watershed event in our industry.

TP: What is it called again?

DF: *Hydra 2500*. That is a metric, so it was rated to 7,800 feet or something like that. It was the first ROV in the world that just had power conductors and fiber. Prior to that, all signals were put down with coaxial cables and that kind of stuff. First of all, you could only carry so large a cable and when you start putting coaxes, they just kept getting bigger and bigger. So we said we were going to go all fiber for our control and cameras, and that was controversial because no one was comfortable that fibers would stand up to a strain. Over the years, what it's proven is that fibers are probably the most reliable part of our umbilical. We have power cables that fail, we have armor that fails, but we rarely have fibers that fail. But at that time, no one knew you could really build an umbilical with a fiber in it; that was the first question.

TP: What do the fibers do?

DF: It's an optical fiber.

TP: It allows you to see. I mean, it's a camera.

DF: Well, it transmits all of our signal data, vehicle control, sonars, depth finders. All your data is collected down there and then it's really digitally processed and it goes up the fiber as light. You just have these light flashes going up and down the fiber, just like your TV that most of all us get around the world through cable.

TP: That sounds like really advanced technology for that point in time.

DF: It was for that point, particularly in that application. I mean, an ROV umbilical is being bent under load, strained, put under pressure, and then pressure's relieved every time it dives, so there were just a lot of unknowns. It's taken a lot of work to get there over the years.

TP: Were you involved in developing this?

DF: We were.

TP: I mean you personally.

DF: I was. We developed that with a company called Western Instruments out in Ventura, California; they had done work for the U.S. Navy. Actually, Vector built the umbilical for us. I believe they built it right here in Houston, then we went and tested it in a pressure tank at Port Hueneme just to see how it did pressure cycles. So there was a lot to go into it.

The reality is, we went to sea trials off Santa Barbara with the *Hydra 2500*, and in thirty days we never made a successful test dive; then we knew we were getting ready into 7,000 foot of water. Yet nothing that failed had anything to do with like the fibers; it was more mundane things. It doesn't matter if it's a mundane thing; if something breaks, it breaks.

But we installed the system on the *Discoverer Seven Seas* in Norfolk, Virginia, and that was an interesting exercise. Joe Yope was the head of drilling for Shell at that time, he was really smart. Ask Howard about him. He'll tell you some Joe Yope stories.

We were up there and the *Discoverer Seven Seas*, it is Transocean now, but it was Sonat then. I'm not sure; it's all the same, they sort of changed their name as they went. They had a rig manager called Bob Herrmann and he had really liked the *Pisces*. He really didn't like our ROV. He had no experience, but he knew the Pisces people.

So we were struggling to get the ROV system installed, and it was a pretty complicated installation because there's not a lot of space, particularly on the older drill ships. So we weren't getting there and we were afraid to run out of time. One day, Joe Yope came on board, he said, "How are you doing?"

I said, "Well, Joe, we're not going to be ready."

And he said, "You've got to be ready."

I said, "Well, we're really not getting cooperation from the rig."

Just then Bob Herrmann came walking by. Joe said, "Bob, come over here a minute." Joe's very quiet. He puts his arm around Bob, and he says, "Bob, it's too late for Shell to get a new rig, but it's not too late for Sonat to get a new rig manager."

Bob says, "We'll have that onboard immediately."

Bob and I have become friends over the years, but it started off as a pretty rocky relationship. He thought I had turn him in to Shell; I'd just told Joe the truth. So that's the way Joe was.

TP: Well, there was a lot was riding on this.

DF: Oh, everything was riding on this. And what was riding on it was, could you really drill in deep water? Could the *Discoverer Seven Seas* really drill in deepwater? Could you support it with an ROV? So the first successful dive that that system ever made was in 6,448 feet, and helped them land the BOP. You wonder why I know that number, but it's just sort of iconic in my mind. It was remarkable.

Soon after that, we blew up the umbilical; we had a power conductor that just blew a hole in it. So we had to literally build an extension cord over a weekend. Then for the next four months, while we built a new umbilical, they would just tape the extension cord. They still had the fibers; the power conductors blew up but the fiber was still good. But they would tape the power conductors to the umbilical on the way down and then un-tape them on the way up. In the middle of winter, on the East Coast, that is hard work.

I think what really was the proving point—and I'm not sure about the time into the project, maybe four or five months—they landed a BOP and they couldn't get a seal and had to buy an [unclear] AX ring. And to recover the BOP to the surface, replace the AX ring and lower it, it probably would have taken them on the neighborhood of seven days. So the question was, could the ROV change an AX ring? Well, historically that had been easy, except in the *Seven Seas*, because of the design shape, the AX ring was actually set about five or six foot up inside of the shroud, so you really could never see it.

TP: AX ring, you said?

DF: AX ring. It's a typical metal-to-metal seal ring used in all BOPs and well heads. It's sort of a classic. There's an AX and a VX and they have to do with the shapes. I'm not even sure who developed them in the first place, but they are set into a groove and then they're landed. With large pressure, the metal deforms and you get a metal-to-metal seal, which in those days was the best seal. Today I think there are synthetics that do every bit as good a job.

So the crew said, "Well, we'll try and build a float so that we'll put the AX ring." You know when they display rings and stuff like that? They sort of put it on a cone in jewelers' displays. Well, they essentially built that, took it down there, and then maneuvered it under the upper part of the BOP, which was suspended, and then let this thing float up there. When they thought they had it up there, they tightened the bolts, pulled out the floatation, and when they landed, they made the seal. So that was pretty unique.

TP: Was the ROV helping in maneuvering any of this?

DF: The ROV actually carried the AX ring and the float down, and its manipulator. So this thing was maybe twenty, thirty pounds. In air, an AX ring probably weighs fifty or sixty pounds, but in water, with the foam, with the flotation, it was slightly positive, so it would float. So the ROV carried it down, swam over, and then just sort of released the rope they had. It was pretty crude stuff. It seemed very exotic at the time, but compared to what we do today, it's amazing, and managed to allow them in hours to do what could have taken them a week. In those days, that was only a million dollars. Today that would be seven.

But I think the thing that that really validated was that we could go deep, and reliability wasn't good, but it was getting better. So there was a lot of waiting time while you fixed the ROV, and then do something that was unplanned, which has always been a limitation of a robotic system is that unplanned work is sometimes very difficult, if not impossible, to achieve; not necessarily because of the robot, but maybe what you're trying to work on was never designed to be worked on with the manipulator and stuff like that.

One of the huge transition points to make ROVs successful is subsea equipment manufacturers had to make changes to their designs. We had to figure out how we could get accessibility. In other words, if you couldn't get to a valve, it didn't matter if you were able to turn it or not. You weren't going to be able to turn it. So the evolution of subsea work has been sort of a continuous cosine or sine wave because the ROV had capabilities but we couldn't use them. Then something else would change and we could work on it, but then maybe ROV reliability had to be improved to get more and more bottom parts. So we've kept going back and forth to this day.

TP: It seems to me that those were some of the problems with the Mobot originally.

DF: Oh, yeah. What could it work on?

TP: Just what could it do around that wellhead?

DF: Right. They have those BOP locking bolts, which are very awkward, and they had to develop a tool which almost looks like a Craftsman toolkit. But like everything else, that's the way the entire offshore industry almost evolved; sort of one problem, then one idea, then another problem, then another idea, and then you'd improve on the solution. You'd go back and looked at some of your early solutions, and say, "Man, that was pretty crude." But at the time that was spectacular stuff.

TP: Cognac is an example of that. No one does the three-piece installation anymore, but it needed that to sort of get out there.

DF: Well, to prove that you could actually install something in that deep of water, and then they built Bullwinkle, of course, which was a one-piece, deeper jacket and stuff. Then they decided that they weren't going to do anything that deep in jackets and we went with subsea completion.

I think the *Discoverer Seven Seas* off the Baltimore Canyon was just a huge event in the evolution of what I call work-class ROVs. It proved particularly to Shell. I think Shell, particularly Shell USA in the Gulf of Mexico, was the most advanced of the oil companies working in deep water at the time. They were committed to develop resources that were in pretty deep water. Many of the other majors were actually focused in the North Sea, which was a lot shallower. That had its own challenges, it had winter weather but it didn't have the step thing. So the various technologies evolved in difference places because of the conditions and circumstances surrounding them, but Shell was probably a leader in deepwater development.

TP: That year, in '83, they were just gearing up to acquire many of these new deepwater leases under the new leasing system in the Gulf of Mexico and they had to demonstrate to their management that you could drill in this deep of water. That was in the Baltimore Canyon before they got those leases.

DF: Not only drill, but could they actually install subsea equipment, complete flow lines, things like that. There were a lot of things that were coming together at that time.

In fact, it was right around that time, not long after, that we went into our great depression in the oil and gas business. But the one thing we saw in

about ’85, ’86, is that we went in the depression and then we started to come out of it. We looked around the world and saw all these deep rigs being built, so we said, “there’s a whole new sort of wave of new rigs coming through.”

Let me step back. In ’84, Ocean Systems, which by this time was owned by Enserch, which is now Texas Utilities or something like that, a gas distribution company in Dallas, they traded Ocean Systems to Oceaneering for owning all the preferred shares in Oceaneering. So we became part of Oceaneering; that was an interesting time.

TP: What was your position in Ocean Systems at this time?

DF: I was probably general manager of remotely operated vehicles. I had about sixty different jobs. One time I went and looked for all my business cards, I gave up after a while. So I was in charge of the remotely operated vehicle program for the world. Even in ’83, we were probably the largest company supporting drilling operations. I mean, there were companies like Taylor supporting their own divers; there were companies doing inspection work, pipeline and platform inspections.

TP: So drilling rigs, not deepwater platforms just yet.

DF: We never did much on the deepwater platforms. When they were installed, it was the construction companies. We did some, but we found that, in doing inspection work, you have a factor. You only do it in the summer, so what do you do with the equipment in the winter? In other words, you have this utilization challenge. And it beats up equipment. You’ve got to get inside jackets to inspect them and that’s hard on equipment. Pilots run into things, they get tethers caught. So we did some of that, but we preferred the drill rig market because you were really on contract for the duration of the drilling program, so you had great utilization of the equipment.

So we kind of focused on that which is actually one of the reasons that Oceaneering was attracted to Ocean Systems. We were way ahead of them and most of the other companies in deepwater ROVs at the time because we focused on that segment. The diving on rigs had almost disappeared by now for Oceaneering. Once ROVs were able to do it, you could take 150 tons of diving equipment and a six- or eight-man crew and replace it with fifty tons of ROV equipment and a three-man crew. So even if the day rates were similar—and I think they probably were at the time—the amount of resources that you sort of consumed, bed space and

deck space and deck loading, was far lower, and you didn't have to put a man in the water.

If you could do the work, then it was a far better choice. And drill support in those days had about twenty tasks, and if you could do those twenty tasks, you could support drill rigs. So ROVs essentially just replaced divers in probably a three- or four-year period, which was bread and butter work for Oceaneering.

TP: On drilling?

DF: Yes. On drilling.

TP: So this was probably in the early to mid-eighties.

DF: That's about it. Yes. Right after BP started using them, Subsea International, who was the Herb Newburry connection, came along too. Interestingly, Herb Newburry was an engineer for Ocean Systems at one time, so there were a lot of connections there. But they did a little bit of work for BP, and BP began to replace all the diving systems with remotely operated vehicles as well, and then everyone did. So in a very short period of time, diving on drill rigs disappeared and was replaced by remotely operated vehicles. So you're right, by the mid-eighties, by the time the market swooned, there was probably some diving still going on, but it was a minority share, and if there's any going on today, it must be very, very shallow stuff.

TP: In a cost-cutting environment, you move to ROVs because of the economy, as you just explained.

DF: Right.

TP: In addition to the technological advantages it gives you.

DF: And the safety. Every time you put a diver in 500, 600, 700, 800 foot of water, there's a certain element of risk. Putting humans deep is more difficult than putting a piece of equipment deep, because if you don't get a piece of equipment back, it's not a good thing, but it's not the end of the world. Equipment's pretty replaceable.

TP: You said you were the manager for the global market.

DF: Right.

TP: But most of your work was probably in the U.S. and North Sea, is that right?

DF: Well, yes. But we also we had some work in Asia at the time. The market was beginning to expand, but the Gulf of Mexico, North Sea, Norway, were the most important. We were probably more effective in Norway than in the U.K. because BP was so large in the U.K., and Subsea International was their preferred vendor.

But, I mean, we had it. Rigs, in those days, would go drill for six or nine months off Australia and then they would go off to Africa, so you never knew where your next job was going to be. But I would say that 70 percent of our work was in those two sectors.

TP: So the operator for oil companies would hire you, not the drilling companies.

DF: Right. And we preferred that. There's always this idea; well, we'll bid it through the drilling companies, and we would make up all sorts of scenarios why that was not in their best interest. There were reasons for that. The way we viewed it is that if we work directly for the oil companies, we could just go and talk to them about things that were or weren't working. If you were working for the drilling contractor, they were your customers, and so if the drilling rig wasn't supporting you properly and they wouldn't help you, you weren't going to do good work for the oil companies and the oil companies would only see that the ROV wasn't getting the job done. We viewed it as a potential conflict of interests.

TP: Like you explained with the example on the *Discoverer Seven Seas* with Bob Herrmann.

DF: That's right. If we'd been contracted with Transocean, then we would have had to deal with one person at a time. He just didn't believe in this technology. He probably though Shell had made a mistake. The interesting thing is that Bob has gone and consulted with Shell and everyone, because he is one of the really innovative drilling people in the industry, and he has been for the last thirty years.

So we have probably worked for the drilling companies. Sometimes there is a good reason less than 5 percent of the time. When you work for nationalized oil companies, if you work under the drill rig, they don't have to necessarily bid multiple, multiple services. They just have to bid one contract to the drilling company and the drilling company then is kind of

free to pick who they want. If Shell wants Transocean to pick Ocean Systems, they say, "Hey, pick them," whereas if they went out to bid, they wouldn't necessarily know who they were going to get. I'm sure there are circumstances where it's worked for all of us, but rarely do we work for anyone but the oil companies on drilling support.

TP: Let's go back to this merger or acquisition by Oceaneering. How did you make that transition, or was it not that big a deal?

DF: Well, it was a big deal. First of all, we had competed against Oceaneering. I had competed against them for seven or eight years, so I hated their guts. [laughs] You know what I mean? They were the bad guys, and now we'd be them. There was sort of an emotional connection that we had to deal with. On the ROV side, it worked pretty well; I ended up being in charge of their group because we had a much larger group. But on the diving side, I lost a lot of friends. When you merge, you rationalize organizations. I think they did a good job of trying to figure out who to pick, but in the case of a near tie, you pick the guys you know.

So on the ROV side, probably the Ocean Systems side ended up with 80 percent of all the positions. On every other side, the Oceaneering people ended up with 90 percent of all the positions. And that's not unusual and it's not wrong, because you do go with whom you know and are comfortable with and believe they can work within your company culture. The reason the ROV stayed is that they really had acquired Ocean Systems to get the ROV group, so it was difficult. It worked out well but for a period there, you often wondered, "What have I gotten myself into?"

TP: Moving out of the bust in the mid-eighties, can you talk about interesting projects or where you found the biggest challenges in further developing the whole ROV technology?

DF: Yeah, I think a couple different paths. One of the things was that when this new sort of wave of rigs came in in the late eighties and in the early nineties, developing people became a real issue. That's because prior to that, we would add maybe an ROV every four or five or six months, so we'd hire people from the navy and from a lot of places. We've got a lot of people who are ex-navy technicians; we've got a lot of people actually out of the fishing industry and stuff like that. And then you'd just put them on a job with another crew, and sort by osmosis, on-the-job-training, they would learn what to do.

We were actually blessed in those days with some really fine supervisors. We took a lot of our supervisors from the diving. As the diving work went

down, we'd hire the supervisors to be an ROV supervisor. And frankly, to this day, I would say that ex-divers make better supervisors than anything else, as a generalized statement. There are a huge amount of exceptions to it, but once you get used to putting a human in the water, you pay a lot more attention to what's going on. I mean, I think you just learn that, and you always treat a piece of equipment a little different than a person who's never put a human down below.

Because divers had to know where they were in the water, they had to know where their umbilical was, if it was getting wrapped around an anode, etcetera. So they gained a spatial understanding of what everything looks like subsea. You don't necessarily get that from the surface, so they would just have more success, as a generalized statement, than a group of people that just were technical and then became operational-savvy, but never had sort of swum around inside of a jacket in 400 foot of water and seen all the things that you can get hooked up on and stuff like that.

But as we began to expand at a much quicker rate, we didn't really have that opportunity to grow people sort of slowly by osmosis. We had to take people with not as much experience and sort of force-feed them, so we set up our first training school. Probably for the first three years, we actually set our people back because we had no idea what we were doing. In retrospect, you scratch your head and say, "How did these guys ever make it?" [laughs]

I mean, the first thing we'd do was to take our technically smartest guy and make him the chief instructor. So we'd take the head of our technical support group, which his real job is to help the people offshore keep the ROVs operating, and we'd put him in charge of teaching the new technicians a class eight hours a day and we would have a thirty-day class.

Well, the technical manager would show up and start teaching and then he'd get a call from offshore and he'd run out to fix it, and he would have fourteen guys sit there for three or four hours doing nothing, and then he'd come back in. So this was just a fiasco. It's amazing it took us a year before we said, "Wait a minute, (a), your smartest guy isn't necessarily your best instructor; and, (b), does he really have enough time to do that or do you want him doing something else?"

I mean, we just sort of made a commitment from day one in ROVs. Our goal was, we wanted to be the best ROV company in the world, we had no interest to be the largest. Over the years, we have become by far the largest ROV company in the world, but that has never been our goal. And so we had another sort of mantra, which is that we would never shut down

a job offshore. Now, we have and we still do, but we really commit a lot of resources not to have that happen, and training people is a defense against downtime. People can fix anything.

TP: What do you mean, shut down?

DF: We're not going to shut down a drill rig. Let's say the rig's having a problem and it needs an ROV to dive to fix something. We never want to be the one that can't get the job done, particularly today, with it costing a million dollars cash. But in those days it was costing 250,000, which was probably every bit as much in today's dollars. So we focused on training and we learned that by trial and error. I'm not sure that trial and error is the most elegant way of doing it, but that probably, I think, sums up the offshore industry in general.

TP: I've been reading through Drew Michel's notes. He talks about all the ROVs that he lost.

DF: Well, there is much more likelihood of that with the inspection ROVS around jackets. Anyone that claims they haven't lost an ROV, then they've never been offshore with one, that's my view of it. I'm skeptical of a guy who's been a supervisor from another company, he's been in for ten years, and he says he's never lost an ROV; no one is that lucky or good. It may be true. But we developed a training school and we spend 12 million dollars a year on ROV training of people. It's become a very sophisticated operation; I mean, in fifteen years we've become pretty good at it. We learn every year, but in those days, it wasn't very effective.

TP: Where is your training facility?

DF: The first one was in Morgan City. Now we have them around the world. We have one in Macaé down in Brazil; we have one in Batam, which is right across the straits from Singapore in Indonesia; we have one in Aberdeen, and one in Norway.

TP: So Oceaneering, I'll bet, is doing a lot of work with Petrobras in deep water.

DF: We do.

TP: Do they have their own kind of diving, ROV or subsea companies in Brazil, or do they mainly contract with you guys?

DF: It's a mix. All the internationals have Brazilian subsidiaries, and we do too, it's a fully owned Brazilian subsidiary. We're on about 40 percent of their drill rigs. We only do drill rig support in Brazil; we don't do any of the construction support. The construction companies do all of that themselves, and that's Petrobras' model for that. So the training was one direction we went on and then we just sort of chipped away, getting better. We took a lot of work. I was on the first of the API committees to standardize subsea interfaces and subsea tooling.

TP: When was that?

DF: Probably about the same time, mid-eighties or late eighties. I was head of the API 17D, which was the ROV that became 17H.

TP: RP 17D, is that right?

DF: It was API. RP are their documents. We started as 17D and then we became 17H, which is just ROVs. I think 17D was a subset of subsea equipment, trees and that. And 17H is that. So I headed that up for a few years. Also in Norway, that was part of the Norsok, which is their equivalent to help write these interfaces. And we did, because all the companies had different kinds of interfaces. So we said, okay, everyone submit it. We put them all in there, and over the years, one or two have sort of become the de facto standard just because they're more effective.

But then we had to do a lot of work with the Camerons and the FMCs, and the National Oil Well [Varco]s, because they don't want to change their designs. Once you have a design, really what you want to do is just keep making more of it. So we had to get oil company people, and we did on the API committees, because in the end, they drive this whole train. If they tell the equipment companies, "No, you need to have this to be ROV-accessible, ROV-supportable, ROV-operable," then the subsea equipment people are going to make those changes. But in and of itself, there's no advantage for them to spend an extra 50,000, 60,000, 80,000 dollars redesigning something when there may be no endgame to them. So it's always been this tradeoff. The interface is 80 percent of the solution; if you get a good interface down there, than an ROV can do anything. If you have no specific interface, then the ROV struggles to do it with a manipulator or sort of some made-up tool and it becomes very inefficient.

TP: So over time, most of the subsea equipment becomes all ROV-interfaced.

DF: Yes, it is; then when a new generation of something comes up, and we start all over. [laughs]

TP: So can you give me a sense of the size of sort of the ROV business and Oceaneering? What's your employee base, your revenues and things like that?

DF: Well, for revenues we'd have to go look at the annual report. I think last year we had about 700 million dollars' revenue. It's the largest profit center in Oceaneering. We have 225, 230 ROVs out in the world, and we have about 1,800 offshore personnel, so we're probably larger than the next two companies combined.

TP: Who are your chief competitors?

DF: Subsea International remains one, and then you have Sonsub, which is a subsidiary of Saipem. They tend to focus mainly on their construction field-support side and don't concentrate as much on the drill rigs. But as we go around the world, we'll find different regional competitors. In Norway you have people called Deep Ocean and Technocean and things like that. So depending where you are, Subsea International and Oceaneering are sort of two that have been there since the beginning and have been going head to head from the beginning, and probably will be when we produce the last drop of oil from under the ocean, which is a long way off, fortunately. So it is a large business. As we said, we spend 12 million dollars in training costs, which is a lot of money for a company. Oceaneering overall revenue is about 2 billion dollars.

So really I think the next big change in where we were in the mid-eighties is that Subsea started building their own ROVs and a lot of the other companies started building their own ROVs. I had always resisted; I mean, all of our people wanted to build it. I have always seen that an operating company and a manufacturing company are just completely different personalities. An operating company, you are only focused on right now, and whatever happens, you are going to do whatever it takes to overcome whatever problem you have right now. A manufacturing group has to be very organized and very precise, and stuff has to arrive and be assembled and tested and delivered when you want it. And I just knew that if we had those two groups together, that if we ever had a problem offshore, we would go pillage and plunder the manufacturing line if they had a part we needed. It wouldn't be a matter of people asking questions; that's just the way it was.

But we decided to manufacture our own ROVs for a couple of reasons. Most external people think it had to do with saving money. I don't know that we can manufacture an ROV any less expensively than Perry or

_____ [unclear] could have, or other companies then, but what we needed to do was to get control of the delivery schedule. We needed to be able to have control over the system.

A huge number of rigs came out in the mid-nineties. Frontier Drilling, everyone was putting out these new 7,000-, 8,000-foot rigs. I mean, there was a huge burst once again, and we couldn't afford to be tied to other companies. Well, it'd take Perry nine months or a year because they were delivering other ROVs. We said, no! We need it when the rig was ready. So we went into the ROV manufacturing business and we did exactly what I knew we were going to do. That is, whenever we needed something offshore, we would go steal it from the manufacturer. Then when we were late, we would hammer on them, saying, "Why are you late?"

TP: So the manufacturing is not really a profit center; it's to support the operations.

DF: That's what it was in our mind. Fortunately, about five years ago we turned it into a professional manufacturing center and it is really good. I mean, we are today the largest manufacturer of ROVs in the world, and we sell none of them, but we manufacturer more ROVs than anyone else.

TP: You don't sell them externally at all? It's all just for Oceaneering?

DF: We've probably built five hundred and sold four. We sold a couple to the navy. We actually sold one to—it was Stolt at the time, but they were a joint-venture partner of ours in Brazil. So, no, we don't do it to sell them. We do it to provide our own operations, and there are a lot of reasons for doing that. First of all, it makes the training process easier because you can put people in the shop to do it, and it makes the standardization process easier because you can at least control whatever you do. We like to think that technologically it's the best in the world, but I wouldn't ever make the case that's true, because I think technology goes in cycles.

The problem is, once you try and standardize, then you make technology advancement a hard thing because at what point do you put a new design in there, recognizing that all your paperwork and all that now—so our view is that if it's a 10 percent improvement, we'll make it. If it's less than that, we won't make it because it creates an awful lot of knock-on, in fact, to your supply-chain management. What pump does that system actually have? For years we didn't have a clue. Now we're getting pretty good at it.

So all those things sort of came into play; as the whole industry's grown more sophisticated, our support side has also grown more sophisticated. But in the end, what we try and understand is that the people offshore are everything. I mean, that's who the oil company's hiring. They don't pay a nickel for my time or stuff like that. So you never want to get so embedded in your process that you begin to forget what makes something successful, and it's the offshore people that make this whole industry run.

TP: The people that are actually out there.

DF: They're doing the job. I mean, we send them stuff out there, and if we don't send them the right stuff, we still expect them to do the job. So our job is to really make sure they've got as many of the right resources as we can beg, borrow, or steal. Sometimes we forget that, but then we've got to remind ourselves what this business is all about, and that is to be able to dive whenever the company needs you to dive, and there's no other measure.

It doesn't matter what your technology is; it doesn't matter what your training is; it doesn't matter what your economics are. If you can't dive when you're called on, you're just not doing what you're being paid for. So we try and keep reminding ourselves of this human element and we try and not become such a big company that we lose track of the fact that it's just individuals; 1,800 individuals who, properly supported, will do amazing stuff, and yet processes and bureaucracies can bring them to their knees.

TP: And time is very valuable, especially offshore.

DF: Oh, it's huge.

TP: So there's always this pressure, from all directions, to do it now and do it right, and we can't delay a week or a month.

DF: No. Then we got into construction vessels and stuff like that. So we're pretty much spread in every segment. The only thing we still don't do is what you call annual platform inspections in the Gulf of Mexico and around the world. That is now a business that's controlled by smaller companies that can move in and out on the summer jobs maybe more easily than we can.

TP: How about decommissioning and plug-and-abandon? Do you guys support that at all?

DF: Yeah, we're beginning to do that. We've been a part of it on the big ones over in Norway. The other part that grew up with our ROV business is the ROV tooling side, the tools that support the ROVs and then hydrate remediation skids and pipeline commissioning skids. I mean, think of the ROV really as a tractor. A tractor out there in the field does nothing for a farmer until he puts a plow or something else on it. The ROV by itself can give you visual information, but if it's going to do some work, then there need to be all these other things.

So about fifteen years ago we started building a group that would manufacture tools and work packages and work skids to allow ROVs to do more than they could do using manipulator-based technology. That is now a 160-million-dollar-a-year business and we sell those tools not only to ourselves but also worldwide. We sell them to what essentially are Oceaneering competitors. We sell them to oil companies when they buy a new series of trees for a field, particularly in West Africa. They'll buy a series of ROV tools and then they'll hand them out to whoever their ROV contractor is. Most the time it turns out to be us, but probably 20 percent of the time it doesn't, so we sell tools to our competitors as well today.

That whole business has become a complicated, sophisticated technology in itself, but if you take the ROV side of our house and the tooling side of our house, and we do have a unique combination there. But we don't lock out the market on the tooling side, because from a business point of view, it makes no sense, it just encourages someone else to build their own tool. So if they're going to have tools, we might as well sell them the tools, because they're going to have tools anyway.

TP: That's something where size probably helps. You have better economies of scale than maybe some of your smaller competitors who may want to go into making tools, but they find it easier just to buy them from you.

DF: They do, and it doesn't take resources. They get it. We don't have a preferred rate. Our ROV group says we always bid everyone else 25 percent higher, then you won't sell anything. So there's always some of this. And this tension is good because it forces you to question, is this a good business model? Do you have the right people in the right place? Are you treating your customers right? Are you even chasing the right customers away? These are the questions we always ask; I mean, we never spend enough time with our customers. No matter how much we do, we always feel that we need to spend more time with them, but sometimes they don't have time for us either.

TP: You're still with Oceaneering. You're not retired yet, are you?

DF: I'm pretending to retire.

TP: Oh, you are?

DF: Oh, yeah. I moved to San Francisco five years ago.

TP: Weren't you based in Houston?

DF: I was in Houston for thirty years. I'm in San Francisco now, so now I just commute more. The biggest thing is that I managed to turn this into a commuting process. I spend about 60 percent of my time working; it's good fun.

TP: I think we can probably conclude here. You've given us some great insight into all of this process, and congratulations on your induction.

DF: Thank you.

[End of interview]