OFFSHORE ENERGY CENTER HALL OF FAME

BOEM DEEPWATER GULF OF MEXICO HISTORY PROJECT

Interviewee: Phil Wilbourn

Date: September 25, 2010

Place: Houston, Texas

Interviewer: Tyler Priest

Ethnographic preface: Phil Wilbourn studied at Tennessee Tech University on a baseball scholarship, and graduated in 1966 with an engineering degree in hand. In 1967, Wilbur signed on with Texaco, and worked for two years focused on shallow-water platforms in the Gulf of Mexico. Wilbur worked for Texaco across the Gulf Coast and in Saudi Arabia. He worked on the design phase for the LOOP port off of Louisiana as well. Wheeler worked with Curtis Burton and Steve Wheeler in investigating the future of technology in deepwater; after Texaco management declined to fund a program up to perhaps $70 million, Wilbourn and others at Texaco used a smaller amount of money to begin setting up a joint industry research group, known as DeepStar. The DeepStar group is widely recognized as helping to advance deepwater and subsea technology rapidly in the early 1990s, and thus contributing to the deepwater boom that followed.

File 1

TP: This is an interview with Mr. Phil Wilbourn. Interviewer is Tyler Priest. We're in Houston, Texas, and this is for the 2010 Offshore Energy Center Hall of Fame Award ceremony.

Congratulations on being inducted. Let's start with a little background. Where are you from and where did you end up going to school?

PW: I grew up in Memphis, went to school at Tennessee Tech University on a baseball scholarship. Basically went to college to play more baseball, and got an engineering degree along the way. Graduated in '66 in a job market that's quite different from today; it was a lot of demand for engineers at that time.

So I spent the first two years with Lockheed in Atlanta. Was out in Atlanta Gear [phonetic] for the C-5A military plane. Exciting, enjoyable, but didn't see myself continuing to be a number cruncher. Texaco had made an offer while I was in school, so I called, contacted them and decided to get in the offshore business. So I went to New Orleans in December of '67. Spent two years there in the shallow water. We were in about 250 feet of water at that time, which was a big deal, considering.

TP: Texaco had a pretty big portfolio with shallow-water fields.

PW: Right. They had four district offices in Houma, New Iberia, and Morgan City and then the New Orleans office. So I spent two years there. The background in computer analysis in the aircraft business sort of led me to suggest that we improve our design techniques and use some of the aircraft technology. So I came to Houston on a special assignment to develop a lot of the software programs that was used in conjunction with MIT. MIT had just come out with the ICES program at the time, Integrated Civil Engineering System. So we adapted the MIT structural analysis system to the design of offshore platforms. So I came to Houston, where our computer programmers were at the time, and spent two years with them developing that software package.

TP: That was around what time?

PW: That was '69, '70.

TP: That was an interesting period for platform design because you had the big hurricanes that wiped out a bunch of them.

PW: Right. Betsy had just come through in '65.

TP: Then Camille in ’69.

PW: Right.

TP: I guess you had some seafloor slides and that was the big issue there. Then the Offshore Technology Conference was just starting.

PW: Just started. The first two years were, I guess, in New Orleans.

TP: Did you know Griff Lee?

PW: Oh yes. Griff is a very close friend. As a matter of fact, I have moved to Tennessee now, when I retired, and Griff’s son runs a nursery fifty miles from where I live now.

TP: Where is Griff? Wasn’t he in Bay St. Louis?

PW: I think so. I think he did retire into that area. Right.

TP: I worry about what happened after Katrina. I haven’t talked to him since then.

PW: I don’t know. I didn’t hear.

Anyway, then I spent two years in Houston and we developed the software package, and then I came back to New Orleans in ’71. It was about that time that Texaco set up an international organization because we had just gotten the offshore leases in Nigeria, Angola, North Sea, some in South America, Colombia and Trinidad and that area. So there was a need for the technology transfer from the Gulf over to the international affiliates. So we set up—that’s what we call Central Offshore Engineering, which is the group in Texaco responsible for the design, construction, and project management for everything Texaco did worldwide.

So that was sort of the jumping off point, I guess, into the international part of the business. We were partnered with REMCO, so we spent time over in Saudi when they first started their offshore development as well as the offshore loading terminals. So it was an interesting time, it was a challenging time, a lot of travel. The LOOP Sea Dock Project came along about the same time in '75, when we put the offshore port in. So I was project manager on that for two years, so it was a good start.

TP: You were the project manager on Loop?

PW: On the model testing, design phase. It was a trying time in the industry because when we built Loop, there was a sea dock, offshore Texas port contemplated at the same time, so both projects were running parallel, had about fifteen oil companies sponsoring them. The only thing we couldn't decide on was the type of offshore mooring system to use. Shell had the patents on one, Exxon had the patents on the other, and as we got into meetings discussing [unclear].

TP: Were they both single-point mooring systems?

PW: Both of them single-point mooring systems.

TP: What were the differences?

PW: Well, Shell's is the catenary anchor-leg mooring. It has six catenary anchor legs to the ocean floor. The Exxon system is called a SAL, single anchor leg. Both of them had merits. Both of them had been used in different places in the world. But when these two groups got together to discuss the technical merits, and it basically came down to a company vote, it was a dead heat every time. I mean it was eight to eight or seven to seven.

So we decided to do extensive model testing program in the Netherlands ship model basin in Wageningen [phonetic]. Holland had the number one model test basin in the world, the one that most people used. So we decided to take both systems over there and do an extensive test. Shell was sending their experts over. Exxon was sending their experts over. So I got a call one day to ask me if I'd go over and be a referee between Shell and Exxon. A very interesting project. Very

interesting because both companies had a lot of pride associated with the system that would come out eventually as the winner. So that got me into the model testing, which led me—

TP: It was the Exxon system that came out ahead?

PW: It was the Exxon system that won out. But later on in my career, I ended up going to Offshore Technology Research Center at Texas A&M and helped design the model test basin that they have. So this whole model-testing involvement was something that sort of carried through my entire career, and it was sort of a hinge point.

TP: Sounds like the refereeing aspect probably would come in useful with DeepStar, too, right?

PW: Yes, it has. It was extremely useful. Instead of two companies, I had about fourteen or fifteen companies in DeepStar to keep happy.

TP: So in the seventies you were working on LOOP, but you were also going around the world with Texaco and spreading their design techniques to the different subsidiaries.

PW: Yes. The technology transfer in the early seventies was a very important part of the offshore business. It was analogous to me coming out of the aircraft industry, which we had a lot of NASA sophisticated fundamental analysis techniques we used in aircraft. The oil industry did not have that. So we took that into the offshore business. The same as the Gulf of Mexico technology in offshore was transferred to the North Sea first, to West Africa, Nigeria, Angola, eventually to South America and then eventually all over the world. But that basic technology transfer was taking place just about that time, in the early seventies.

TP: Were technologies then transferred back to the Gulf a few years later?

PW: It was probably when the deepwater technology really came to the forefront. The best way to describe it was there's a guy, Mike Gernhardt, who was a diver with Oceaneering. Mike was a Vanderbilt graduate, Ph.D., did his thesis on the problems divers have when they resurface, the bubbles that develop in your bloodstream and things of that type. Mike had been one of the best offshore deepwater divers in the Gulf, but with that education background, when NASA contemplated the Space Station, they came to Oceaneering and said, "The technology that your divers have developed we think will be applicable in putting the Space Station together."

So Mike was taken out of the offshore business, sent to NASA, trained to be an astronaut, and went up on the second flight to assemble the Space Station. To me, that was the complete circle on technology transfer, NASA to offshore, offshore to the Space Station.

TP: People always draw the parallels and make comparisons between space exploration and offshore exploration or marine exploration.

PW: Yes, quite similar. Right. The lack of gravity, things of that nature. Mike had developed a special boot that he wore with his diving, that had sort of a prong on the heel, so when he walked around the template on the ocean floor to make himself stationary, stable, so he could get leverage, he would activate these prongs on his boots and they would enter a specially designed latch on the template so that would stabilize him and he could lean over and reach and whatever. He took that technology into space, and the space walk boots had the same prong on it. So it was very interesting. I tried to get the *Offshore* magazine to write an article about him one day. I actually wrote an editorial article, but we wanted to put Mike on the front cover of the *Offshore* magazine with a diving helmet on one arm and a space helmet on the other arm.

TP: Any stories about this time that you know, that you can share with us?

PW: The travels to the foreign countries was such an experience. I teach now as an adjunct professor up at Tennessee Tech, and I try to encourage the students to pursue careers outside the State of Tennessee, outside the U.S. I basically tell them with an engineering degree you have a passport to see the world. But they're not interested in the excitement of it anymore, and it was exciting at that time. Meeting the foreign governments when we got into China, we got into Russia, it was a very educational experience.

TP: Maybe we can move on to talk about DeepStar. From your perspective, how did this all come about?

PW: It was an in-house brainstorming session. Steve Wheeler, Curtis Burton, and I were sitting around one day and basically we looked at Texaco's portfolio of deep water leases in the Gulf of Mexico and West Africa and the North Sea, and it was a consensus among us that we had the technology to drill five, six thousand feet of water, but if we had a discovery, we really didn't know what to do.

TP: This would have been about what time?

PW: This was in the early nineties, '91, '92.

TP: So Texaco had gotten its leases in the Gulf in the eighties, after the [unclear] sales.

PW: Right. And there'd been a few discoveries made, and there was some indications that the reserves in the Gulf of Mexico were of the size that could be justified from an economic standpoint, but looking at the technology available to basically produce in six thousand feet of water, it basically wasn't there.

So we put together an in-house program that said, here are the technologies that need to be developed or evolved, and this is the timeframe of how soon we think we can develop the technology, and this is roughly the cost. So we went to Texaco's board of directors and made a presentation on what we thought the company should do in terms of funding. We were basically told, "There's no way we can afford that kind of money."

TP: What kind of funding were you talking about?

PW: We were probably talking five, six hundred million dollars. So the instruction we had was, "Go back and see if you can't figure out a different way of doing this."

In the brainstorming sessions we had that followed that, we sort of felt that the other producers, the other oil companies, might be in the same situation we were in, so we contacted some of them informally. Sort of the feedback we got from them was, "We see the same problem, and we really don't know what the answer is either."

So we basically sent out a letter to all the producers. We knew probably twenty-five oil companies. "Here are the technology areas that we think need to be evolved. This is our priority and our top five areas that we think we need to receive the most attention. What do you think about it? Are these areas that challenge you also? Are our top five in your top five? Or, if not, are you willing to share your top five with us?"

TP: What were your priorities?

PW: Stage recovery was sort of our top one. We were in a time where the MMS was telling us, "If you drill a well in deep water and you have a discovery and you test the well, you have twenty-four hours to test it. That's the maximum we'll allow you to flare oil and gas from an environmental standpoint." We were dealing with our people in the North Sea, and they were having thirty-day tests, forty-five-day tests, sixty-day tests on wells, which in sixty days you learn a lot more about the reservoir performance than you do in twenty-four hours.

So we were looking for a way to do sort of a stage recovery, where we'd test for a long period of time, evaluate the reservoir. We knew we were going to have hydrate problems. We knew we were going to have paraffin problems in deep water. We didn't have the mooring systems. We didn't have the riser technology using composite materials. A lot of those things were on the top of our list.

But the response we got back from the industry was incredible. Everybody said the same thing. Everybody said, "We have the same problems."

During this same period of time, we were getting five or six proposals a week from contractors and consultants who were out there supporting the industry, who were trying to guess at what our needs were. They were sitting back in their office saying, "What do you think the operators need in terms of technology advancement? We have an idea. This is an area that we have an expertise in. Let's make a proposal to do this." We were spending a lot of time evaluating proposals. We were supporting one out of ten or fifteen. So there was a lot of time being wasted by the contractors proposing things that were not high on our priority list, and they weren't high on the operators' lists either.

So the thought was if the operators have the same concerns we have, and there are contractors out there with capabilities but they do not have the guidance from us as to what to work on, how can we get everybody together? So once we got those responses in and we got a few informal meetings together, we just adopted a fundamental strategy that the lawyers absolutely shut the door when we said this. They said, "There's no competition in developing technologies. The competition is in the application of the technology."

So basically what we said was, "We can all go in together and develop a technology. Once that's developed, then the commercialization of that technology is up to the operator's needs. If you don't ever have a discovery success in deep water, you don't have an application. But if you want to join with us to develop it in case you do have discovery—."

TP: The lawyers were really concerned about antitrust?

PW: Antitrust. We were fortunate at the time; Al DeCrane was president of the company at the time. He was a lawyer, Notre Dame. I had a good working relationship with Al, and my discussions with him was fundamentally, "Keep going, but don't get us in trouble." So that's a tough charge when you have that risk of the antitrust people stepping in and saying, "You can't do this."

But the legal people of the other companies, they went along with it. We structured the contract so that we would have contractors come in and listen to our presentation—ours, the operators' presentation—of "We think we need this technology. If any of you out there have that expertise back at your office, go make a proposal to develop this technology. We will listen to your proposal and your proposal and your proposal. We will pick one of the three and we will fund it, and once we fund it and get it to the point that we think it's technically workable, then you go outside the door and you make your deal with any operator you want to. So we're not in the commercialization of it at all. We're not involved in helping you sell it."

TP: So it's almost like venture capital.

PW: It is.

TP: You're not taking the proceeds, but it's kind of like a—

PW: Seed money.

TP: Seed money for contractors.

PW: Right.

TP: It's not technology that the operators are developing themselves.

PW: That's right.

TP: It's purely for the contractors.

PW: Because they had the expertise, and we didn't have that expertise or the manpower to develop it. And it was a common technology that we all could use, up to a certain point. But, of course, along with that you had to have a strategy. You had to have some goal that you were headed for.

TP: Was it hard to get company operators to tip their hats about what—

PW: Initially?

TP: —what they were interested in and what kind of technologies they were interested in seeing developed. I mean, I can imagine that the companies that were sort of ahead of the others, I'm thinking, in particular, Shell. Was it hard to get them to come along on this?

PW: That was the hardest company to sell at all. They were the last one to join, and I can understand, because they were ahead of everybody else, and they sort of felt

that way. And we all agreed, "If you join, we basically want you to bring everything that you know about this particular technology area to the table. Lay it on the table. You might have ten pages, I might have one page, but we're going to put it all on the table. We all pay the same amount of money, we all attend the meetings, we develop it together, we define what the contractor should do."

It got to the point where one Thanksgiving I was up in Tennessee playing golf with Rich Pattarozzi of Shell, and during the round of golf, I told Rich, "You know Rich, you're the only company that's not in." And the next Monday their guy from New Orleans came over with a check. So it wasn't that I shamed him into it; it was just the realization that we needed them.

TP: So what was the equity cost or the share cost by each company?

PW: Cost-wise it was about a forty-to-one ratio. We defined the dollar value of the technology that you will get is forty times what you put in it, and we started off probably $250,000 a company.

TP: You had twenty?

PW: Had about twenty companies, yes. We had about fifty contractors, about ten or fifteen consultants that were involved in it. The contractors, of course, they didn't pay a fee. They paid an initial small fee, $5,000 or so, to be at the table, and that was just a fee to cover our actual cost. But what they were getting out of it is they were listening to fifteen operators sit there and say, "These are our needs, and if they fit your area of expertise, it should benefit you because now you know what to propose to us. You're not sitting in your office trying to guess at what we want to see." And that saved them a lot of time and a lot of money, all the personnel putting proposals together. So the strategy worked well in bringing everybody together, but everybody anticipated a different application.

TP: It was all forward-looking.

PW: Yes.

TP: "These are the needs we're anticipating in the next five-, ten-year horizon."

PW: That's exactly right.

TP: Not what we definitely need right now.

PW: That's right. We all know we do not have the technology right now, and we don't have the discoveries right now, and we haven't had the time to do the economic evaluation of other discoveries. At the time that we were doing all this, the key to making a deepwater discovery economical, we knew it was total production and total reserves and reservoir size, but we did not key in on how critical the per-well production rate was. We had no idea.

TP: That wasn't appreciated till Auger, right?

PW: That's right. That's exactly right. Shell designed a platform with twenty-four wells and we used ten, and they had the capacity already. So once we got into the economic analysis and had a few discoveries and realized how prolific some of these wells were, then it changed the whole ballgame for the ultimate production tool. We designed everything for twenty-four wells, and, all of a sudden, ten is enough.

TP: Was there any concern by the Justice Department or lawyers, once this started going, about the companies sitting down at the table together?

PW: We brought in MMS in day one. We said we have to have them sitting at the table from day one. We want them not only to identify any regulatory issues that they see that might come up so we can start addressing them early, because we don't want to get way down the road and have everything on the table and we can't apply it because of some regulatory issues. So they were on board initially.

I guess the most disappointing thing to me along the way was as we visited with national laboratories, Sandia and places like that, we could see the vast amounts of money that the government was giving those guys to work on technologies that were quite similar to what we was working on. As a matter of

fact, I went to Washington one day and had a meeting with Hazel O'Leary, who was the secretary of energy at the time, and it was fundamentally, "Madam Secretary, you're working on the same thing we're working on. You're spending government money on things, but your scientists at these laboratories do not have the interaction with the operators and the industry people to know exactly what our needs are, and the application of that technology. They're sort of in a black box. So let's work together. We will volunteer our time to go sit in front of your lab people and tell them what we're working on and what we think they need to be working on and what they need to be spending tax dollars on, because we have the application. The sooner we can apply what they're working on, to me it's win-win for you and the laboratories."

Got an absolute, "No, no, no. We know more about what we need to do than you do." So that working relationship did not develop until later on, and that was disappointing.

TP: This was about '92, '93, when you first started?

PW: That's right. That was early '93, '94 era.

TP: So initially it was just the contractors and the operators in this?

PW: Right.

TP: But later the national labs and universities were brought in?

PW: They did come in. They did come in. We finally convinced some of the universities to work with us.

TP: Why would the universities be resistant to doing so?

PW: They were not resistant. It was the labs. The universities, I think they were the last group that we really thought of as a resource. We went to A&M to start doing

model testing with OTRC. Of course, it was under way at the time. But some of the other universities we didn't bring in as early as we probably should have.

TP: I want to ask you more about DeepStar, but I did notice the little anecdote that you told, and maybe we can get you to tell it on camera, about Clarence Cazalot in the first meeting at the Grand Hotel.

PW: It's probably why I enjoyed my career at Texaco, because I'm a conservative person and Texaco is probably *the* most conservative oil company in the business, especially in the early days. The old-timers used to tell me the stories that during the Depression they'd go around to the service stations in New Orleans and take money from the stations and pay the workers there on the spot. The money didn't go through the company system to get paid. So everybody appreciated that, and it just had the reputation of being conservative.

Clarence Cazalot was vice president with Texaco at the time, here in Houston, and when we had one of our first DeepStar meetings. So imagine a group of Texaco people trying to sell the rest of the industry on this joint industry project, the cost. The total amount of money is quite a bit compared to what we're normally used to funding in our normal JIP. So we put together a sort of introductory meeting here in the Galleria, and invited everybody after hours to come in and have a drink and listen to our pitch.

Well, we felt like we needed to have Texaco senior management there to show the rest of the people that we had their support, so I invited Clarence to come over and just visit with the group. I was primarily interested in him seeing the magnitude of the project and the level of interest. So Clarence comes in about thirty minutes after the meeting starts. It was well attended, and the cost of putting on the show was probably a little bit more than we had budgeted for. So when Clarence walks in, he's totally shocked that this is a Texaco-sponsored event and in such an elaborate setting. He had not seen that before in Texaco. So I finally got his attention. I said, "We're getting ready to explain the program to everybody. We're going to take fifteen minutes and sort of describe it. Would you mind just saying a few words to show your senior management support?"

And so Clarence gets up there and he looks around, and I guess this is just the first thing that came to mind, he started off by saying, "Do you guys realize that the copper wire was invented by two Texaco engineers trying to stretch a penny?"

So the rest of us sort of got the message that maybe Clarence is telling us that you might be spending too much money here with this dog and pony show.

TP: He didn't want the other companies to think that Texaco was always this extravagant.

PW: Yes, that's right. It wasn't the image that he wanted to have us portray about Texaco at the time.

TP: What kind of annual budget did DeepStar have in the early days? How much seed money were you [unclear]?

PW: It started off probably in the neighborhood of two and a half, three million. It grew to twenty million. Today I would say they're probably in the 200 to 300 million dollars a year on the efforts that's going into it. It's continuing. It's even evolving in terms of application today. Same basic companies. Some have dropped out. Some new people have joined.

TP: But there are phases, is that right?

PW: Yes.

TP: How long do those phases last? Two or three years?

PW: We didn't try to define them in terms of years; we tried to define them in terms of goals. We tried to develop a Phase One technology was just to get us to the point where we could do a long-term test on a well, make an economic evaluation of the potential, and have hardware designed such that if you put that hardware on a delineation well and you produce that well for six months or a year and the reservoir performance justified an optimistic case, then you could add to that equipment and go into a next phase, where you might have a full-scale shallow-water development, deep-water tide back to shallow-water platform. Then if it was really more than you anticipated, you could go into full-scale development. So it was giving you an opportunity to not spend 100 percent of the money to develop deepwater day one. You could spend about 20 percent so you could get more information. Then you could go into Phase Two and maybe spend another

30 to 40 percent. But you could walk away from it if it wasn't, like I said, as prolific as you thought.

So that sort of led into everybody that joins, again, has different application. They can take that one well, the discovery they have, and if it doesn't test to meet their economic standards, they walk away. A lot of the standardization of equipment, interfaces of different types of equipment was something that was very important, because if you put a system in, test a well, and you walk away, you didn't want that equipment to be wasted. You want that equipment to be applicable somewhere else with another field you had or another operator could use that same equipment. So, standardization of interfaces was a key element of the effort.

It's interesting, if you looked at the *Wall Street Journal* last week, you see the effort that just got started with Chevron, Exxon, Shell, Conoco Phillips, four companies that have said, "We need a system developed that can be used to handle a BP situation."

TP: Is this the well-containment corporation?

PW: That's right. So it is following the exact same cooperative effort that DeepStar did. DeepStar is the model that they're using for what they're doing now. So we've gone from developing the technology to using that same business model to develop a containment system that in the early stages we didn't anticipate a need for.

TP: Are the NOCs involved in this at all, the national operating companies or national oil companies?

PW: Petrobras was involved early on. That's the only NOC that I know of that when I left, when I retired, that had been involved in it.

TP: They're the one that's pushing the envelope with deepwater?

PW: Oh yes. The risk involved in the NOCs—today I manage a project called GUCENET, it's the Global Upstream Cost Engineering Network, where I have

the cost engineers for about ten major oil companies that we get together about twice a year and discuss best practices and estimating costs scheduled for deepwater high-risk projects. It's all IOCs. It's not NOCs, because the partnership arrangement with NOCs around the world limit that amount of sharing to a certain extent.

TP: Do you remember, how did the priorities evolve specifically? Mainly, I imagine, subsea engineering, questions about subsea engineering, not major conceptual designs and TOPs versus FPSOs and such. Or maybe there were elements of that.

PW: Yes, subsea was the key to it. We started off with the idea that we wanted a shallow-water gathering platform that were already there, that were almost at the stages of abandonment but still had capability, that we could tie back to within—I think sixty miles was the limit. We wanted [unclear] platform out in maybe four or five hundred feet of water that we could go subsea out into deepwater tieback. So the subsea technology, the flow-line technology, the multi-phase flow, handling the paraffins, handling the multi-phase flow was the number one consideration.

Then the gathering of clusters of wells, and then eventually going out—and just the idea that multiple companies could eventually support and sponsor a deepwater gathering station, if you will, where you could put a facility in deep water and have five different companies leases tied back to that same facility, and either a loader, an FPSO, or pipeline back to shore. The TOPs and the SPARs and all that, they were there, but there was more effort being put in those by the contractors at that time than other areas. That was the big push at the time. Horton and [unclear] was almost on the horizon, and TOPs that we'd looked at, even subsea. We all participated in the Lockheed one-atmosphere chamber system back in the seventies, and that was one that had multi oil company support, but it had Lockheed as a space contractor, if you will, supporting it. And then the SEAL system came along, the French company that had the wet tree, and we supported that also. So the subsea trees and the subsea systems and SPARs, they were evolving, but a lot of these other smaller areas of technology is where we focused.

TP: Do you want to change the tape? They just want to change the tape real quick here.

[interruption]

TP: I was reading some of the OTC papers on DeepStar, one by Steve Wheeler where he stressed the need to develop a common link. Can you talk a little bit about that? Because every oil company has different words for the same thing, and there would seem to be immense benefits for everyone, the standardization that you talked about, but also a common language for procedure and systems engineering, in addition to just the technology.

PW: Yes, the language, the terminology—I'll call it terminology—especially when you start dealing with people that come into these different companies from overseas. The North Sea terminology is different than what we use in the Gulf of Mexico, but it really boiled down to this interface. If you look at project-management teams now, the interface between different contractors comes back to terminology. One contractor calls it one thing, another one calls it something else. So they're literally people on the project teams now, that is their sole responsibility is interfacing to contractors, drawings, standardization of specifications, some as simple as CAD drawing techniques and symbols.

When you have multiple contractors working on the same project, it's very, very important, and we did. We had a problem with language at the very beginning because it was more so in the economic arena. We didn't talk a lot about getting in-house economic evaluations or your thresholds on the project that pass muster in your company for funding, but just fundamental economic terminology. To try to define where everybody was coming from was difficult, very difficult.

TP: How are they defining a barrel of oil.

PW: That's right. We finally got over the press constantly referring to a spill is in gallons and production is always in barrels.

TP: They haven't quite gotten over that yet. You still hear it.

PW: No. It's almost deliberate.

TP: I think it is. The numbers are higher. It's more of an impact, more eye-catching to see 42,000 gallons rather than 1,000 barrels.

PW: That's exactly right. We had a gentleman from Alaska come to our university and speak, when we were talking about ANWR development, and he was from one of the groups in Alaska that was basically for development of ANWR. But any university debate, you always have to have both sides. So a gentleman that was opposed to that development got up in front of these students and he said, "Do you know how much oil has been spilled in the Gulf of Alaska since Valdez?"

And the students were all looking at him and they said, "No, really don't know."

So the guy goes to the board and writes a number, and the number had probably twenty zeroes after it, and it's just a number on the board in a lecture room at a university. So you look at the number and it's a big number, so the perception of the students was they spilled a lot of oil since Valdez.

So I attended the meeting. I sat in the back row. I told my wife, "I'm not going to say a word. I'm going to just sit back here incognito and just listen to these two gentleman talk." Finally, I couldn't take it anymore. I finally raised my hand and I said, "Sir, would you mind just putting some units on that number up there, just for my own verification?"

He said, "What difference does it make?"

I said, "Well, there's a big number. I don't know if it's cups." But that was exactly the—

TP: Was it cups? [laughs]

PW: Well, I told him, I said, "You know, I was at Valdez about six months ago, and I saw the reports on how much oil that actually had been spilled up there, and I've done my conversion back here, and if I'm correct, that number is cups."

And he said, "What size cups?"

I said, "Like a cup of coffee."

TP: Eight ounce.

PW: That's right, and that's exactly what he had done. He converted the few barrels that had been spilled to cups, and put that number on the board up there. And he was going around the country doing that.

TP: That's intellectually dishonest.

PW: It is. It really is. But you take students, and the perception is reality.

TP: I'm really interested in this transition to deep water. It's fundamentally different than on the shelf, and that seems to be what DeepStar was all about. The industry had gotten to a point where they learned how to operate in shallow waters. They got to a thousand feet. The oil industry, if it's criticized from within, it's about "Well, you're always trying to apply old concepts to new problems and new problems that require new concepts." It must be almost a cultural challenge to operators and contractors to get them to almost throw a lot of what they knew about how to operate on the shelf and to think about the challenges of deep water.

PW: It was, but we didn't have the benefit of going out in a gradual mode, like you would normally think about technology being evolved in hundred-foot increments, because if you look at the shallow water from the bayous and bays of South Louisiana out to 250 feet of water, when I first joined the industry, that evolved over probably a fifteen-year period of time.

But there were a lot of experiments that were—not experiments, but a lot of applications that people were using. It was almost like the automobile industry. Occasionally, if you look on the hood of a car, you'll see ports or wires or whatever there that you don't see any use for, and if you talk to someone who's knowledgeable about automobile development, they will tell you that, "Well, that's for the next generation of that same motor so we don't have to redesign everything. We put that port there so when we do come out with that new gadget, that's where it plugs in."

So I think a lot of that was going out in the 700, 800 feet of water range. We put two platforms in California in Santa Barbara in 850 feet of water in '84, '85 area. Eight hundred feet of water didn't seem that much into the deep-water arena at the 6,000-foot range, but a lot of the things that we were doing as far as repair, maintenance, going out with divers, a lot of that technology was applicable

later on. But you're right, a lot of places we just jumped straight from 1,000 feet to 6,000, just right off the bat.

TP: It's hard to go from your experience being based on fixed platforms to floating systems. There are challenges, but there are also opportunities that you have with a floating system that you don't have.

PW: The ocean drilling program that was started up at Texas A&M, the one that basically confirmed the continental drift theory back in the sixties, I guess, a lot of that technology was brought to the table. We had a gentleman that works with us at Texaco that was on two legs of the *Challenger*. He told a story of drilling a core off the coast of Spain, and I think they were in something like 10,000 feet of water. They didn't have the conventional riser. All they were doing was running drill pipe down, taking a core, bringing the core back to the surface, and that was it. But they actually had drilled—drilling for a core out in 10,000 feet of water in the early eighties, maybe the late seventies.

There was an accident on board. A gentleman was hurt pretty bad. They were so far off the coast of Spain that they could not get a chopper out quick enough, so basically what they did was they pulled the drill pipe, stacked it, they started sailing towards the beach, and the chopper or boat or whatever was coming out to get the guy started sailing this way. So they met halfway, what have you, and expedited getting this gentleman to the hospital quicker.

The *Challenger* turned around and [unclear] went back out to that same location. They had hydro foam set up on the ocean floor for their positioning, they reentered a twenty-inch hole in 10,000 feet of water, in the late seventies. So that dynamic positioning technology that was used on the *Challenger* program was very much the forerunner to what we used on [unclear] thrusters on FPSOs and the floaters in the Gulf.

So a lot of that technology was transferred, and a lot of people didn't know that this was, of course, a National Science Foundation-supported project, the *Challenger* was. The technology transfer took place by the personnel that the oil companies loaned to NSF to run the project. When those people came back to their parent companies, I think that was when it took place.

TP: How long were you involved with DeepStar? It started in '92.

PW: In ’92 we first got started. My role as the general manager of this offshore engineering department was basically to get it out of our office and get it up to our senior management and get the support, and that was a difficult task. We were told by several members of our senior management team that we didn’t have the money, we didn’t think it was applicable, we’d wait and let contractors do it the way we had done it before, and that’s the way the oil industry had always relied on contractors. The Brown & Roots, the McDermotts had pretty well dictated what we did offshore for a long time. So I was sort of the one that flew sort of the air cover for the team. Like I said, DeCrane said, “Don’t get us in trouble, but keep going.”

As the general manager, my job was just to make sure that we had the funding from the other affiliates of Texaco to support this effort, because we were basically a cost center. We managed projects for Texaco worldwide, but we charged that division for our services, and at the end of the day, my department had to have a P&L statement. We had to show that we had taken in enough money to support the salaries and benefits of the people in the group.

So DeepStar was something that was not a moneymaker for us. It was strictly just like any company looks at research. So we had to keep those people supported financially, and so that was my job until ’97.

Back to this model testing program. Texas A&M had developed the OTRC, the Offshore Technology Research Center, in cooperation with all the rest of the industry back in, I guess, the early, mid eighties, late eighties. So a lot of the initial SPARs and TOPs had been model-tested up at Texas A&M, and, of course, that was in 400 or 500 feet of water, which was the goal.

As soon as A&M saw us going, the industry going into deep water, their vision was, “Well, if you go into deep water, you and the industry are going to go to Holland to the Wageningen model test basin or to Stavanger to Standard Oil’s model test basin to test all of these deep-water concepts. So isn’t there a way we can keep this here in the States, keep the technology here, keep the employment here and all of that?”

So I had lunch one day with my boss and a director with Texas A&M, and he sort of spelled out what their ideas were on expanding the OTRC to handle model testing of the deep-water structures.

My response to him was that, “Your business plan, I don’t think, will work. I don’t think the industry will support what you have in mind.” So I threw out a couple of ideas I had, based on having worked in the [unclear] ship model basin, and see how they operate over there. The Dutch are the best civil engineers in the world. They’ve always had that reputation. So you can see how they operated and their emphasis on instrumentation and how accurate the instrumentation was, and how they did not run a test until everything was exactly

right, and they ran the test one time. They didn't run a test five times and have different degrees of instrumentation not working each time, and try to consolidate it all at the end and take the best of five tests, because it distorts the picture.

But anyway, after that meeting I came back, and a few months later my boss called me in and said, "A&M would like for you come up there and spend a couple of years with them, helping them define this new model test basin." So at the end of '97 I chose to go ahead and go up there, and I went there for two years and then retired at the end of that time.

I got a little taste of academia up there. I got a feeling that that's what I wanted to do with my life after age fifty-five, so I went to the academic world and was not ready for the surprises that I found in academia. They were a lot different than working in the [unclear]. [laughs]

TP: But you helped them develop the new model test basin?

PW: Right.

TP: Are most of the floating structures out in the Gulf tested there?

PW: Right. Yes, they do a majority of the testing of the TOPs, the SPARs, FPSOs. It's a really unique situation up there. It gives the people, especially in the Houston area, easy access to it. The students that are able to come in there and work on their master's degree and work in that basin, they come out and work in the industry. I mean, they're in great demand. So it's a really win-win for the university system and the industry. It's worked real well, real well.

TP: But DeepStar was involved in all aspects, I mean even geosciences in addition to subsea engineering, is that right?

PW: Yes. They branched out. Initially, we were primarily just facilities oriented, and then it did branch out into some of the reservoir aspects, something I didn't get involved in a lot. That was all after I left in '97.

TP: So you left just before the merger with Chevron.

PW: Right. The merger took place about a year afterwards, yes. Most of the people that worked on DeepStar that were with Texaco have left to go with other companies. You'll see tonight, when we're bringing part of the DeepStar team back together, they come from different directions.

TP: Can you just, offhand, name probably the biggest successes of projects that DeepStar funded during your time?

PW: I think the number one success was the joint effort, the willingness to accept the fact that you can't evolve this technology by yourself, the idea of working together, a group of companies directed at one single problem, throw in all the resources and manpower behind it, that was the number one success. The little individual things that happened along the way, I don't think I can pick out one or anything that really stands out. They all came together.

TP: It's cumulative.

PW: It was a systems approach, but you did have to have people that had the vision. The nice thing about my role was I had two people that spearheaded it, Steve Wheeler and Curtis Burton. Steve Wheeler was the technology guru. Steve had the vision for the technology that needed to be. He never used the term "developed." He always said it needs to be evolved. Everything that we were going to try to do is there now; it just needs to be evolved into the application that we anticipate.

Curtis Burton was the consummate salesperson. Once you had the idea, then someone had to go sell it to the industry. Someone had to go sit down with each individual company and convince them to be as much of a supporter as Curtis and Steve were, and he did a great job of that. So those two people working together, without those two, it would never have worked. The tenacity that those two had and the working relationship they had together was fantastic.

TP: We're going to be talking to them this afternoon.

PW: Good. They both come at this project from a totally different perspective, but it was [unclear].

TP: But you were at the management level of all this?

PW: Air cover, that was what I was trying to do. I kept them supported, kept the people in Texaco behind it, convinced our senior management that this was worthy of funding and that these guys do have Texaco's future in mind with what they want to do.

TP: That reminds me. There's kind of a precedent for this, if you look at the offshore industry historically. It wasn't a lot of companies coming together, but Shell's School for Industry in '63. I don't know if you had heard about that.

PW: No, I hadn't, no.

TP: It wasn't a lasting thing, but Shell in the late sixties developed the semi-submersible and what they called as root access and remote underwater drilling and completion method, but when they went to lease sale, they couldn't get the leases that they wanted, because they were the only bidder. In order to really evolve the technology, they needed the contractors to be brought up to speed. It was really something that they developed. So they held a three-week school for industry and they shared everything with the industry, January, February of '63.

PW: Yes, that was before I got on board there.

TP: But it was the same kind of principle. We can't go out alone, the company. We have to bring everyone along to solve the problems that are not of a competitive nature.

PW: I'm sure Carl Wickizer was probably involved in that with Shell at the time.

TP: He was probably very young then, but was the guy that brought Shell into DeepStar, I guess.

PW: Rich Pattarozzi was at the top. Once Rich supported and then Carl got on board, Carl could see the benefit, I think, before a lot of the people that worked with Carl saw it in the New Orleans office. Bob Vee [phonetic] and people like that that were involved with Shell very early on, that we all had these JIPs—that's Joint Industry Projects—that we all participated in. Lockheed was one of them, SEAL was one.

The dynamics were interesting, because you get in a meeting like that and here's the Lockheed petroleum services people up here saying, "Okay. This is what this one-atmosphere chamber is going to look like, and this is what the valve interface looks like," and all this hardware, and you could see people in the room that—the Shell people had already sort of envisioned this, but they wouldn't say anything. It was like, "I'm not at liberty to tell you that I agree or disagree with this." And then you have people at the table that didn't really know what the subsea tree was all about, but they were supporting this project with the anticipation of learning from it.

So the exchange of information in those days was not as great as it was after DeepStar, because we had to have people—you've just got to leave your baggage behind when you come in here. If you see something that you've tried that didn't work, we need to know about it. If you've tried something that did work and it moves us up this learning curve quicker, you've got to agree that you've got to let us know about it. So things started coming out from the discussion that moved that curve like this instead of like this, because if everybody sort of held back, the learning curve would have been very slow.

I think Shell realized later on that even though they came in the program further up the learning curve than probably most of us were, quickly brought everybody up here, and once everybody was up here, it was easier to project it on out because you weren't bringing people along at a slow pace. The dynamics of the interface of the people totally changed, and you see it even in projects today how it's much easier. Just like this [unclear].

TP: In the late nineties, I know at Shell, and I think also at other companies, this move to contractor alliances. Do you think DeepStar had an influence?

PW: I think it did. I really do. I think we established a better rapport with the contractors. It wasn't thus and thus; it was everybody was together and a lot of the deepwater projects around the world were. We signed a lot of them with contractors where they had a vested interest. Here's the contract, here's the fixed lump sum, whatever target number. If you bring this project in 5 percent less than that number, we'll share the savings with you. If you bring it in five million dollars less than the bid price, we'll give you two and a half of that. So in the sixties and seventies we never have had that relationship. It was always contractor and operator butting heads.

But I really saw a change in the alliance. In the North Sea they coined the phrase "alliance." When you had a project that was being evaluated, the first discussion was contracting strategy. Was contracting strategy going to be an alliance for the contractor? Will we bring somebody in early on and work with them in the front-end phase, and that contractor knows they're going to be involved with it throughout. Or do you just go ahead and do the old way of we do all the engineering in-house, and then you bid it competitively lump sum. We all saw that resulted in a lot of the Brown & Root, McDermott legal problems we had with them back in the eighties and early nineties. I think the model has had far-reaching effect on the industry, I really do.

TP: And I imagine there'll be new phases coming out of this whole *Deepwater Horizon.* [laughter]

PW: I was really surprised that the containment system didn't come out of DeepStar. You had the operators and everybody involved already, the contracts. I don't know the legal structure of this new containment alliance, if it's a different group of people or what, but it's just a logical extension. The same way with abandonment. The emphasis on abandonment now is going to be much stronger than it has been. There is probably one best way of doing this abandonment, instead of each person sitting down doing their own.

TP: There's a new rule on idle iron abandonment.

PW: Exactly.

TP: I appreciate your time. I think we can stop here. This has been very entertaining.

PW: I enjoyed it.

TP: Congratulations again.

PW: Thanks a lot. Thank you.

[End of interview]