OFFSHORE ENERGY CENTER

ORAL HISTORY PROJECT

Interviewee: HOWARD SHATTO

Date: September 30, 2000

Place: Houston, Texas

Interviewer: Joseph A. Pratt

Side A

JP: This is an interview for the OEC of Howard Shatto. The interviewer is Joe Pratt. The date is September 30, 2000. I would like to start the interview by asking you Briefly, for the record, to tell about your own education and how you became involved in the offshore industry and then;to ask generally your reflect1ons about being chosen as one of the pioneers in the industry and parts of your life that illustrate your own experience in this amazing industry.

HS: It has been an amazing lifetime, really. I did get into the offshore end of things pretty early. After finishing school with a bachelor's degree in electrical engineering from Yale, I went to work for Shell and went through the training program. It took two years. And then, my first assignment was to Shell's new New Orleans area. The first task I had was to put together Shell's first diesel electric rig which was a swamp rig meant for use in inland dredged canals. But we decided to put it first offshore and since the barge was 10 feet thick. we had to put a shell bank down to rest it on. We did that. It was several miles offshore in only 10 feet of water. It was an exciting time.

We sank three ships - LSM war surplus ships - to a seaward of it and anchored them with piling. The first well was the Discovery and the third well blew out. The fire engulfed the rig and the well blew for 21 days. At the end of that the well crated and what had been 10 foot water for miles round now was a 100 foot deep hole at the center and 1,500 feet in diameter - a nice cone shape. And the sounding showed no trace of the rig or the three landing ships, they were all swallowed up in his great hole.

JP: Welcome to the oil industry!

HS: Yes, not a great beginning but an exciting one. The Shell involvement offshore has gone from that time forward through East Bay, Rig 10 East Bay, and until about the late 1950s when we started working first on a caisson development at the lab in Houston. That was kind of short-lived because there was no way it could really go very deep. It was essentially a large pipe with the wellhead on the ocean floor at the bottom of the pipe, it had atmospheric pressure.

That soon became a subsea development effort.

About that time, I was sent to the West Coast to Long Beach. I became Division Engineer there and after about one year in Long Beach, I was asked to go to Los Angeles to get into a very secret organization which was our effort on the West Coast to do some deep water subsea wellhead developments for producing wellheads. The idea in that case was conceived by Bill Bates, who made the division manager. He was my boss. I was division engineer in that group. Bill Bates and Glen Johnson, who had been president of Bashross Tool Company, who was quite a good wellhead designer, got together and put together this idea of using ROVs - remotely operated vehicles and used them on wellheads in water of hopefully beyond diver depth for water depth.

Well, I got into that group as their division engineer and we had a wonderful time. We were doing our development on the West Coast in Los Angeles pretty much in competition with the group that was already working on underwater completions in the lab in Houston. That competition was deemed useful by Ned Clark, who was the executive vice-president in charge of exploration and production in New York, on the basis that this whole effort was important enough that we could afford to take both avenues. The area that was being developed in Houston at the lab was based on the use of guidelines and was supposed to be a diverless completion operation. It was felt that if we did everything just right, they

would'nt need divers outside the wellhead and of course, inside.

On the West Coast, we thought that scheme was based on the idea that it was unlikely that we would be able to do without intervention altogether and we needed some way to address problems on the outside. So, we developed the first remotely operated vehicle called the Mobot; by Hughes Aircraft. Hughes had done some work in atomic energy, where they had developed electrically operated arms for remote control of the things that people could'nt get into. They were interested in trying to develop that capability under water as well. So, we worked together. They developed the arms and the Mobot and we did the work on the wellhead.

At the same time, we developed the dynamic positioning for the vessel Eureka. That was a small core drill ship that the exploration people wanted to get core holes 500 feet into the ocean floor all up and down the West Coast. Let me back up here and say that the idea for holding a ship still with propellers was actually first advance, I think; by Willard Bascum at the National Science Foundation. They decided to outfit the CUSS I with Four swivelable propellers, and they rigged up a sort of manual control scheme to operate

With. They took it offshore in about 11,000 feet of water off the Guadalupe Islands of the West Coast. They did

drill successfully, although it was quite a chore to try to keep the vessel within the buoys they had put out at a 400 yard radius. In effect, they were sort of live boating but with such deep water, that it didn't really make that much difference.

That same idea of using propellers was to be built into Shell's vessel, the Eureka, but when I got into the project. I saw pretty clearly pretty early that trying to do that in anything like shallow water would be extremely difficult, if not completely impossible, to do by hand by moving propellers in the direction they needed to be in order to hold the heading in the X and Y positions all simultaneously. Subsequently it was proved to be completely impossible To try to do it manually in anything like shallow water. As a result of that, we fought for some period of time.

I finally figured out a way to do that and we did get patents in that area. We got Hughes Aircraft to build the control system for a total cost of $50,000, and now they are up in the range of millions of dollars. Bu7it was extremely successful. We got core holes in 4,000

feet of water where the anchored vessels had been limited to about 200 feet of water. The Eureka was so mobile that we were able to get as many as nine core holes per day)where the anchored vessels would take typically one day to anchor the vessel, another day to drill and unanchor and move. So we were getting nine core holes a day and they were getting one every two days. An enormous order of magnitude, faster and in much deeper water, more than an order of magnitude, in deeper water.

They were very happy, the exploration people were very happy with dynamic positioning. We thought it could eventually be used for deep water drilling or real oil well drill ships. Other people thought any decent sized oil well drill ship would take perhaps as much as 40,000 horsepower and, of course, that would be out of the question. But the building rigs, now they built quite a few of them that size and with that much horsepower and they are quite successful.

The first dynamically positioned oil well drill ship that was built by Sedco for Shell and I was asked to go to The Hague. It was actually Shell International VIPM that had asked Sedco to build this vessel. I was sent there to work with Sedco to get the DP system built in particular for that rig.

JP: In what year would that have been?

HS: It was built in Tamana, Japan at Mitsui's yard in 1970 and 1971. It started operation in November of 1971. Although we had a lot of teething problems,>< to start with, it became very successful and set water depth records out there in 2,400 feet or so. It was a big step forward) a n d that one was really sponsored by Shell International.

Shell US, in the meantime 1961, 1962, we did the first of the underwater wellheads. The ROV development and the first dynamic positioning.In 1963, we taught a course for industry s everal did Humble. Exxon was one of those who came.They said it somewhat skeptically but before they left their man in charge stood up and said it was the best money they had ever spent. It was a real compliment to those of us who put the school on, wrote the material and talked for days. That was in January of 1963, the Shell school.

Right after that, I was asked to go to New York to do licensing in the exploration and production area, and particularly to see if we could do any good with the

couple of hundred patents that we had acquired in the meantime. I guess I was sent there because I had 35 of them myself. They were almost all U.S. patents. A licensing group in London, our patent group, they had not filed most of those cases, certainly in the area of dynamic positioning. They had filed only a couple of them. The first ones we had, which were the most basic ones, they elected not to file because they did think at that time that it was a very important development. Later when they decided that it was a good idea, then they started filing the later patents.

In the licensing area, I visited most of the drilling contractors and one of them, as a matter of fact, was Bill Clements at Sedco in Dallas. Bill was very polite when I asked if they would like to take a license. He said, "Well, we'll take it under study." They studied and fought and fought and studied it, and nothing really Moved along. We f1nally figured that the only way we would be able to make it move would be to bring a lawsuit against some drilling contractor. After I left that group one year or so later, they finally did bring a lawsuit and found out then that the drilling contractors had been indemnified by the oil companies that they were working for. So, the licensing division had to go to the other oil companies to see if they could do some good. They

Finally did, they settled with them. I do now for how much, but it was worthwhile.

I got back into the deep water business again in the early 1980s. I worked on the Cognac platform project. It was kind of interesting. The platform was built in three sections… the three sections were built on land, put on barges, taken out and lowered to the ocean floor then the second section was lowered to meet with the first section was very much l1ke a reentry that we had learned how to do for drilling operations using ROVs in maneuvering the vessel, they asked me if I would work on that project. I was the manager of computer control engineering in Houston at that time doing field automation, on land. But this was an intriguing prospect, so I ended up moonlighting on that work.

JP: How did that part of the Cognac go? Did that go fairly smoothly?

HS: Fantastic.

JP: It seems impossible.

HS: Well, the thing at first that seemed so impossible was that we asked the McDermott people how long it would take to move the vessel from one place . . . to move this pair of vessels with the hanging section between them and anchor it with 12 anchors. How long would it take to move that wherever it needed to be in order to dock to the lower section. They said at least 12 hours. In the meantime, the tide is going to ebb and flow and this hanging package is going to go with it. But it just did seem practical at all. figured out a way to do that with just a little bit of math, I did it on the slide rule back in those days. Hewlett-Packard came out with a little pocket calculator that made it much easier and quicker. So, we ended up doing it that way. And we could make moves then for putting the 24 anchor piles into the sleeves. It took two or three moves to get to in where we needed to be. We could make those moves in It took two or three moves to get to 15 minutes each by doing it with arthritic rather than trial and error. It was so successful, that we started using it on all of our offshore anchored drilling rigs. We had five of them in operation at that time and we could cut a move down from 4 hours down to 20 minutes or so over a wellhead, so it is a big savings.

JP: So, the drilling technology helped with the mating and the mating experience helped improve --- -------

HS: Exactly.

JP: You talked earlier, before the interview started about your role later in the dynamic positioning committee that u formed. That would be a good thing for the record. A few years ago 5, 6 or 8 years ago, we saw a lot of brand new, very deep water rigs being developed, and in some cases be1ng developed by people who had never done this before. We Thought it was kind of a frightening project to have the possibility of risk of damage or problems caused by inexperience.

We thought what we really ought to do is we could to pull the industry up by the boot straps and by taking several people . . . there were quite a number of peoplet-who did have experience in deep water operations, dynamic positioning in particular, to pull them together, and we got several of them to form the Marine Technology Society's Dynamic Positioning Committee. We held our first conference in 1967 and we have held one every year since then. There will be another one this year on October 17-18, a two-day conference. We have about 250 people attend usually. It has been a very successful forum for the interchange of information on dynamic positioning. The first year was pretty much a primer, that worked to help people who were not familiar

with the subject at all. The later years have gotten much more close to the cutting edge. It has been a very useful forum.

Along with that, the Dynamic Positioning Committee has also been trying to address a couple of other areas. One is the reliability issues. It costs about two million dollars each for a disconnect caused by disruption of dynamic positioning capability. If the dynamic positioning system fails for any reason or the operator makes an error for some reason and the vessel goes off position, it would cause a disconnect and would cost a couple of million dollars, the old DP control system for a new vessel costs in that order of magnitude. So what it says is that if you have very many of those disconnects, you have got an enormous cash flow down the drain If that cash could be somehow put in the hands of the people who could make the equipment better, it might help avoid some of those big expensive mistakes. So what we are trying to do is gather failure data and use that to see if there are any ways in which the computer could be used more effectively to advise the operator more effectively to keep from making whatever kind of mistakes they are making that cause the failures. That project has been taking a long time to get under way for several reasons. I think most of the drilling contractors now

are pretty well convinced that it is a very worthwhile thing to do for all those good reasons. Although, of course it really means they are washing their dirty linens publicly and that is a difficult thing for them to do.

JP: Is this an advisory committee? Is it for profit?

HS: No, the Marine Technology Society itself is a nonprofit organization and all the people that have on the committee, they are all volunteers. Some are with drilling contractors, they DP engineers are with drilling contractors. Some are with oil companies. Some are with global industries. Pipe lay people. They are not all drilling people. Dynamic positioning there are now thousands of DP vessels in operation around the world.Many of them are diving support vessels, supply boats, pipe lay vessels, all kinds of work boats as well as drill ships.

JP: That is particularly important with the deep water pipeline so they know where pipes go…

HS: That has been a very effective use of dynamic Positioning. I have worked with Global industries to put dynamic positioning on their first reel barge, the

Chickasaw. That was, for them, a real money-maker because they could lay pipe as fast as they could reel it out off the reel. They had to stop every now and then for another installation, but other than that they could go at a much faster pace than they could by doing it themselves along with anchor. Since then, they have built another two more DP vessels - one is the Pioneer work boat and another one, a much larger pipe vessel, the Hercules

JP: I guess the Hercules is pretty amazing.

HS: It is.

JP: It is an old Brown & Root North Sea vessel. You had told a short story that I think would be interesting for the tape about the birth of your first child, about how you were working real hard on these technological innovations and trying to balance your family life also, and you gave birth twice in one era, you said, or twice in one couple of day period.

HS: I cannot say that I gave birth. My sweet wife, Ann, did that part but while she was having our first baby, our daughter, who will be here tonight as a matter of fact with her husband, they just had our first grandbaby

. . . well, our daughter was born in 1961 in March and I was in Houston looking after the testing of our first underwater wellheads and first Mobot robot ROV controlled wellhead operation. That was being done at the Gasmer test facility in Houston. I got word that Ann had gone to the hospital a week or two early. I caught the first plane I could, which was a puddle jumper that landed four or five times between Houston and Los Angeles. each timeI got off the plane, I put quarters in the telephone, and before I could get hold of anyone who could tell me anything, they would call the plane again, I had to run back and get aboard and go to the next place. I did finally make it in time to see the baby in the baby room and see Ann wheeled out from the delivery room and all was well. We were very happy!

JP: I asked earlier for your reflections about the role of Shell in offshore development, particularly in the Gulf of Mexico. What were Shell's major roles and why? Every time we talk about almost any technology, there are Shell people involved. Do you have any reflections on why Shell became so important?

HS: It is hard to say. I think Shell believed, from early on, that deep water development could be profitable. That has waxed and waned over the years, and the

developments have taken some interesting courses. There were people who said we were crazy to develop ROVs and dynamic positioning)but they have turned out to be real begins in the business. There were even people within Shell who felt that. But I think they are all satisfied now that those are good things.

There was a time when various companies, including parts of Shell, thought that the right thing to do was to put people down in some sort of encapsulation at short sleeve atmospheric pressure, inside either submarines or diving delves, or inside a capsule around wellhead. An Shell, at one time in the U.S, was doing some development work and Shell had had sponsored the development built a manifold with a one atmosphere chamber around the wellhead manifold to be put at the ocean floor. That has so many potential hazards to it that that was pretty well abandoned after the first area of development.

There was some work that had been started even earlier than that by the Shell group in The Hague. They had built a tourist, which was doughnut-shaped, at one atmospheric chamber. That was in the early 1970s, I guess. I have forgotten whether that came before or

after Shell Oil's involvement with the one atmosphere chamber, but it, too, ran quickly into some very difficult problems involving safety. And the best thing I think they decided to do in both cases at different times was to get people out of those things, to keep people outside and let the machines and the remotely operated vehicles do the chores underwater. But when one thought that that sort of thing should be abandoned, then the other side took it up for some reason and thought it was maybe a good idea.

JP: How much coordination was there? You were at Shell from 1946 to 1987? over 40 years. How much cooperation/coordination was there between Shell and the Royal Dutch group?

HS: It increased over the years. In the beginning, there was very little. I occasionally saw people. People would visit from The Hague to learn what they could about what we were doing and there were people that came from this side that went to The Hague or worked in parts of other countries for Shell. But they were very few and far between and there was almost no direction given by Shell and The Hague to what we were doing at Shell in the U.S. Gradually over the years, the communication became much more effective. At one point, as I mentioned, I

was sent with the family to live in The Hague for 3-1/2 years while we built the Sedco 445, the world's first dynamically-positioned real drill ship.

JP: Why do you think Shell was so successful in attracting such a crew of dedicated technology people, engineers and others in building this ongoing presence ?

HS: I don't know. I don't know that our engineers were that

much greater than other people's engineers. I have known some very good ones at other oil companies as well, of course, but at least at times, there were times that came at important junctures. When Shell management decided that they really needed to go this way and wanted to encourage the development as rapidly as possible, I mean, that is a wonderful state to be in as an engineer, to be told to go faster and to do everything that you can that you think is the right way to do it. It is a wonderful time. had a lot of those periods in Shell, particularly in the deep water development. And as deep water wentfrom 10 feet to 7,500 feet with the Discover Seven Seas, at various depths all along the way, there were greatopportunities for advancements. I think Shell management is to be complemented for having faith that the problems involved could be overcome. I think Rich Patarossi is one of those to be honored this evening. He is one of those Shell managers with faith that all of these good things could be accomplished.

JP: When you look back over your now almost half a century in the offshore industry, do you see any lessons that stand out or anything that you might like to tell people in the future listening to this tape about this era in the

offshore history?

HS: Well, one thing I should say is that this era is not Over, by any means. It is, in many ways, I don't know whether it is the middle or what but there is still an awful lot left to be don -we are going to be needing oil and gas for the foreseeable future.There is a limited supply and we are going to need to find all that we can, I am sure, and an awful lot of it is going to be in deep water.So, I think there is still a great future for a lot of development work in this area.

JP: All right. Is there anything you want to add to the tape that you want to say?

HS: I cannot think of it.

JP: Thank you.

HS: You are very welcome.

JP: You are a smooth talker. I wish I could talk in sentences like you do.

THE END

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