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Interviewee: Bauer, Robert "Bob" F
Interview Date: October 2, 1999

OFFSHORE ENERGY CENTER

ORAL HISTORY PROJECT

Interviewee: ROBERT F. BAUER

Date: October 2, 1999

Place: Houston, Texas

Interviewer: Tyler Priest

Side A

RFB: I am Robert F. Bauer, Bob Bauer.

TP: This is an interview for the Offshore Hall of Fame, which Mr. Bauer is being inducted into this weekend. I thought we would just start off the interview by having you give us your background. Where did you grow up? Your educational experience?

RFB: I might begin by indicating that I have been associated with the oil industry for 65 years. I was a high school dropout. I went to work in the oil fields as a roughneck when I was 16 years old. I am 81 now, so that adds up to 65 years. I worked in the oil fields 7 days a week as a roughneck in 1934 when I was 16, until 1937, at which point in time, I had accumulated enough money to start college. I continued to work through my college years and until I retired in 1983 from the company I founded, Global Marine.

TP: This was in southern California?

RFB: Yes. I entered USC, in the petroleum engineering school. In the interim, between 1934-37, I had taken correspondence courses, high school correspondence

courses, from the University of California. And I did go back to my original high school where I had started in Grand Junction, Colorado. I spent a couple of months there and sort of talked my way to a high school certificate which, at the time you entered USC wasn't terribly important, as long as you had the money. I did enter USC and ultimately graduated in 1942 with a degree in Petroleum Engineering. I had one football semester taken out of it. I played football at the University of Utah in the interim, so it took me a little bit longer to graduate.

I debated about an advanced degree, a master's or a Ph.D. or something, but in those days it wasn't as important as it is today. There weren't a lot of them.And I had some entrepreneurial aspirations anyway. I thought I would probably learn more by working for a large company for the equivalent period of time it would have taken me to get an advanced degree. So, I went to work for the Union Oil Company. The head of the Petroleum Engineering department at USC was a man by the name of John Dodge, who was very prominent in the industry. He advised me that I would do well to go to work for Union Oil Company. Early in the game, I had an understanding with the personnel director that I didn't want to fool anybody, I told him that I had some entrepreneurial aspirations

and precisely what my thoughts were.

The company had a practice then that the top executives -- the chairman of the board, the CEO, the whole works -- would come to the Research department where I wound up. They would come down and visit about twice a year and give the people who were in Research the opportunity to come before them and tell them about the projects they were studying.

My big project then was working on the extraction of bitumen from bituminous sands. It was a consequence of the U.S. government taking all the steel from the oil industry to build liberty ships. I was otherwise going to go to work in the drilling department; I had a practical, vocational, degree in drilling oil wells. And, in fact, throughout my tenure in college, I was working, pushing tools or drilling, or firing boilers, or something. But when they took all the steel from the oil industry to build liberty ships, we couldn't drill any more oil wells.

We didn't have the big-inch pipelines in those days; we had to develop another source of fuel oil to fuel our Pacific fleet. There were extensive deposits of bituminous sands (tar sand) in California that were

subject to process to extract tar and convert to fuel.

My tenure in Research led to an association with Mr. A.C. Rubel, Vice-President of Exploration and Production for Unocal, which was Union Oil Company of California then. I was transferred ultimately from Research into the Drilling department. I picked up my slide rule and my pencils and reported to the head of the Drilling department. When I arrived, Mr. Rubel had left a message for me to come to his office. He explained that he would like to have me work for him directly. He explained that he had often had people come to him with concepts, ideas, and he would like to have me help him evaluate them. Sometimes, they were good ideas, and rather than put them in Research, where so many projects stay and never comes out, his idea was, why don't we just try something to see if it works? And knowing of my aspirations, he said, "Well, if some of them do work, you could be in business." Typically, one of these things was an electromagnetic method of exploration, a "doodle bug" which people are still working on, but not very successfully. It seems to have potential and probably we will learn about it in the course of time. Maybe I am behind the times. Maybe others have learned how to make it useful.

Another such project was to build a diving bell for gravimetric surveying in the Gulf.

TP: So, we are talking still during the early 1940s? World War II period that you were transferred over into Exploration, in the drilling part of Union Oil?

RFB: Yes. I did test the doodle bug in several different places where the geology was real simple and shallow. We knew the oil was there and we knew the sands were there and we tried to see if we could prove it with the doodle bug.

It was, I guess, in 1953, that Mr. Rubel called and wanted me to represent the interests of the so-called CUSS Group. 1953 was the year that the Eisenhower Tidelands Act was passed, defining, as you know, the mineral resources in the submerged lands, up to a three-mile limit belonging to the state involved. In essence, he told me I was to manage the interests of the CUSS Group. "CUSS" was an acronym for Continental, Union, Shell and Superior Oil Companies. I reported to the heads of those companies. They were in California. Mr. Rubel was the representative of Union; at Continental, it was a man named Olen Lane; at Superior, it was Howard Keck; and at Shell, it was Sam Bowlby.

We had two objectives. Anticipating the development of the submerged lands, we had an exploration program, and prior to my involvement, there had been geologists involved. In fact, the chief geologist for Unocal, a man named Louis Waterfall, managed the geologic and geophysical program of the CUSS Group. There was another geologist, a Ph.D. who was very much involved in the geologic and geophysical program. His name was W.W. Rand.

[PAUSE]

TP: So, back to 1953, you had been assigned to represent Union's interest with the CUSS group?

RFB: No, I represented the four companies and was the manager of their operations offshorejwest coast and reported to a board of their four top men: C Olen Lane, Continental; U - Cy Rubel, Union; S - Sam Bowlby, Shell; and S - Howard Keck, Superior.

TP: At that point in time, what was your sense about the potential of offshore oil in California, or I guess in general? What kind of expectations did you have going into this endeavor?

RFB: Well, I never had any question or doubt that there were oil fields offshore, or would be oil fields offshore. As I started to explain, there were two facets of the program: one was to develop the technology that would allow for development of the submerged lands. The other was to gather geologic data to know where to drill. There was very little done in the Gulf of Mexico, which is where it all had its beginning in very shallow water. However, in California, you can take a broad jump and land in one thousand feet of water in places. This led to the development of drilling from a ship.

We thought we had made a big discovery when we came up with the idea of the wave-transparent unit (which later became the semisubmersible). We searched the patents and found that a geologist in Washington, D.C. had patented a similar device. A patent attorney and I purchased the patent rights from the geologist.

We did a lot of hydraulic lab testing, and for a number of reasons, we thought that the drill ship was the way to go. Our reasons were:

1) Safety of personnel. Since the beginning of time, man has found no safer way to be at sea than in a ship-shaped hull. Lloyd's of London insured all

the offshore drilling rigs, and the cost of insurance for drillships was 5-7 times less than that of any other offshore rig, including semisubmersibles (semis) and bottom-supported units.

2) Carrying rotary mud. The ability to carry a lot of rotary mud is profoundly important. In fact, rotary mud is the only way we have to ultimately control a blow-out. Rotary mud is supported above water, or in the air, on a semi or bottom-supported unit. On a ship, the mud is supported by the water (it's easy to hold a person up in the swimming pool but very difficult to hold that person up in the air).

The support of mud in the ship's hull by the water allows for the immediate availability of large quantities of rotary mud.

3) The windage on a ship. The matter of windage is very important in moving the rig across an ocean. The drillship, of course, can travel under its own power, while the semi, or other mobile rigs, must be towed. Transit time is much less using the drillship. This is especially true due to windage on the semis or other type units. The windage on a

ship versus the semi is tremendously different and is very important to holding the rig's location. The ship presents much less surface to the wind. This can be reduced by adjusting the mooring lines or the dynamic positioning system so that the drillship heads into the weather. The ship is designed to present a minimum of free board to the weather.

To illustrate, assume a given wind velocity imparts a force of 10 pounds per square foot to the ship or the semi. Then, assume the height of the free board is 20 feet and the ship's beam is 40 feet. Then 20 x 40 = 800 square feet of surface exposed to the wind.

The upper part of the semi is like a box that is 60 feet deep and 200 feet on a side. Then, 60 x 200 = 12,000 square feet of surface. Figures here are used for example:

Ship, 20' x 40' x 10#jsquare foot = 8,000#
Semi, 60' x 200' x 10# square foot= 120,000#
8,000 pound force on ship, and
120,000 pound force on semi, or
120 divided by 8 = 15 times

Thus, the force acting on the semi is 15 times greater than the force acting on the ship in this example. It is not uncommon to have wind velocities impart as much as 50 pounds or more per square foot.

If the wind strikes the semi at an angle, the surface exposed is further magnified, with a corresponding increase in the force. The attitude of a ship can always be changed by rotating the ship so that it remains headed into the weather.

Furthermore, the force of the wind is magnified as it strikes the semi on a long lever arm. The distance between where it hits the main body of the rig above the water line to a point well below the water line, where a mooring line passes through a fair lead to an anchor - this distance could easily be as much as 150 feet, or more.

4) In transit, the matter of windage is very important in moving the rig across an ocean. The drillship, of course, can travel under its own power. The semis, or other mobile rigs, must be towed. Transit time is much less using the drillship. This is especially true considering the effect of windage on other types of units.

5) Stability. Drillships, like passenger ships, are relatively unstable. This simply means that the angular motion, rolling and pitching, is much slower, which makes it much more comfortable for passengers, and workmen are more efficient. In many instances, semis are somewhat superior to drillships in this regard.

6) Angular Motion. There is a pivotal point near the center of the ship where angular motion is minimal. Theoretically, there is no angular motion at this point. This is the obvious reason for using the center well (the hole in the center of the ship). It also provides a much safer and efficient working derrick floor.

It should be noted that protection against sharp bending in the drill pipe resulting from the occurrence of angular motion is provided by an inverted, horn-shaped steel structure suspended in the center well. Bending of the drill pipe is limited to a very long radius by this inverted horn.

7) Heave, resulting from long period swells of as much as 100 feet (as off the Scandinavian coast) can be difficult.

Heave is compensated for by a so-called bumper sub (or slip joint) in the drill string on top of the drill collars. Riser tensioners compensate for heave imparted to the conductor pipe between the well head on the ocean floor and the ship. It is interesting to note that in the Cook Inlet of Alaska, where we did the first drilling, the tide was as much as 30 feet. Therefore, there were times when we could not drill ahead as fast as the ship fell on the tide. Hence, we had to pull up on the drill pipe, even though we were drilling the hole deeper.

8) Relocation. The drillship can be moved readily to a new location (in case of a blowout) using mooring lines or dynamic positioning. A relief well can then be started immediately. The relief well is drilled at a safe distance from the blowout and is directed to intersect the blowing well near the bottom. Heavy mud is then pumped into the blowing well, causing it to be contained.

9) Cargo. The drillship can carry far more cargo to the location -- enough pipe, mud and cement to commence drilling.

10) Setting up to drill. The drillship can set up to

drill in a much wider range of both water depths and inclement weather, from choppy seas to huge long period swells. Bottom-supported units were damaged when legs were bounced down on the sea floor.

11) The drillship is perhaps more adaptable to mechanized, automated handling of equipment, such as drill pipe, casing, etc., since ballasting is not a problem. Further, pipe can be racked vertically below the working deck.

I should add at this point that the work done by Bruce Collipp with the semisubmersibles certainly made it an effective tool.

The drillship pioneered offshore drilling in most of the areas of the world.

At the time I was loaned to the CUSS Group, the law in the state of California would not allow for the development of the submerged lands unless the state could demonstrate that there was drainage from the uplands. That was a very limiting factor. Furthermore, if they did have a land offering, the successful bidder could only develop and produce wells from an onshore site, or so-called "filled lands."

Monterey Oil Company did acquire a concession in the Los Angeles harbor area in shallow water. It is my recollection that they drove piling in a circle and then filled the enclosure with rocks, gravel and dirt to make an "island." This constituted filled lands, and they did drill some wells and produce them on the island.

In addition, the state of California had a bidding procedure that required filling in a blank in an equation (second degree) in order to determine the royalty that the bidder would pay to the state.

The equation related to the royalty paid to the state to the MER (maximum efficient rate of production) equals barrels per day of production per well, plus a limit on the rate of production per well, etc. I've forgotten all the elements of the equation.

One land offering was made using this equation. On this occasion, the CUSS Group submitted a bid factor ofand Richfield submitted a bid factor of .2_. Now, if the equation indicated that if the royalty (R) paid to the state was:

$$R = \frac{1}{Bid\ Factor}$$

and the CUSS Group bid

$$R = \frac{1}{2}$$

then this equalled a royalty of 50% and Richfield's bid of

$$R = \frac{1}{5}$$

equalled a royalty of only 20%!

The above is just an example of how an equation could work.

Incidentally, the morning after the first and only use of this method of bidding, the Los Angeles Times headline in three-inch letters was: RICHFIELD PAYS STATE 100% ROYALTY.

Incidentally, there was such a flap over the bids that the Lands Commission declared that the bids be opened for all to inspect.

I tried to get the State of California Lands Commission to understand that our bid of "2" was by far the best

bid. However, everybody knows that "5" is greater than "2," hence, of course, Richfield should have the bid.

When Richfield saw our bid, with our island and causeway, etc., they immediately adopted our engineering development plan. The site, in fact, looks now like the picture we submitted in our bid.

TP: So, there was no cash bonus? It was just a royalty based on this equation?

RFB: Yes. There was a land offering made off of Rincon Point, California, in an obvious place where there was going to be oil production. We contemplated building an island. When I say, "we," I refer to the CUSS Group, we came up with the concept of building an island out there and putting some palm trees on it, and rocks around it. And as a last resort, I went to the State Lands Commission, who were the people (Lt. Governor, Director of Finance and Director of the Commission) in California that awarded the leases. I asked if I could have a causeway built from the land to that island and still have our bid acceptable. I was assured we could add the causeway. We hired a good photographer to go up on the cliff overlooking where this all was going on and had him take a photograph. We turned the photo over to an artist and

an engineering group, and they drew in the island with the palm trees on it and the causeway.

The whole situation at that time was kind of crazy because Signal Oil Company had leased all the upland drill sites and they had a paid lobbyist. This fact turned up at the eleventh hour.

We had to change the legislation in the state of California so that the state could make land offerings without the need to prove drainage of the uplands and would allow for drilling and producing wells offshore. We also had to change the bidding procedure, which we drafted and was passed - legislation that essentially followed the bidding pattern used in the Gulf - a cash bonus at a fixed royalty.

Union Oil loaned me a lawyer to help me draft a change in the California legislation. The lawyer was about ready to retire, a nice old guy, but I went to him and told him what my problem was. I expected him to do it, but he said, "Well, have at it." So I did. I would bring it back and he would cross the T's and dot the I's. We did draft some legislation, and it had to go through one of the committees, but we couldn't get it out of committee. There was a lot of lobbying, and one of the big lobbyists

was a Signal guy they had hired because they had control of all the upland drill sites.

TP: So it didn't get out of the committee?

RFB: It didn't get out of committee for a long time.

TP: What period of time was this?

RFB: This was about 1953.

TP: Right after Tidelands?

RFB: Yes. It didn't get out of committee, but I wrote a speech for my mentor, Mr. Rubel, when he went before the committee. This was my introduction into politics and I was amazed at the way it worked. If they didn't want a majority, everyone would be over at the Senator Hotel across the street from the government house, drinking coffee. I naively talked to the political reporter from the L.A. Times paper . . . "My gosh, why don't you tell the public what is going on?" Well, he looked at me like I was, which I was, at 35 years old, very naive! But anyway, the committee . . . I have forgotten which one it was, the general service or whatever, met to hear Mr. Rubel. They sat in a segment of a circle at an elevated

position so they could look down on him. Mr. Rubel was a big man in the oil industry at the time, and a fine man. They were rude and abusive, and he finally gave up on giving his speech. There was a guy named Burns who was the head of that committee from Fresno.

In any event, we had flown up in the company plane for him to make this presentation and then we flew home. And the next morning, a Saturday morning . . . it was Friday that we were up there . . . and on Saturday morning, he called me early in the morning, like six o'clock, and said we had to go back to Sacramento, which we did.

It was supposed to be the end of the legislative session but they had stopped and turned the clock back. What had happened . . . somebody had come up with this lobbyist who was illegal. I guess they hadn't qualified him in some respect, I don't remember now . . .

TP: Signal's lobbyist?

RFB: Yes, Signal's lobbyist. And all holds were barred then and they passed the legislation. We got up the next morning and flew back to Sacramento. They passed the legislation known as the Shell-Cunningham bill. This was the bill we drafted to change California's offshore

bidding practice.

TP: Modeled on what Louisiana was doing in the Gulf of Mexico.

RFB: Yes, they bid a number of dollars for the right to explore.

TP: Talk a little bit about the evolution of the drill ship concept that CUSS was working on through the 1950s.

RFB: As I remarked, when I got into the act, there had been some activity on the part of the geologists gathering data. I believe they had been gathering geologic data as early as 1948. They had purchased the Los Ciencia and the Decatur, two small wooden-hulled minesweepers.

I think early efforts involved using a clam shell or grab samples from the ocean floor, using the wooden-hull minesweepers. They used the steel-hulled Navy patrol craft, dubbed, appropriately, the Submarex, with different sampling techniques for recovering geologic data. On the Submarex, a boom was hinged to a mast located amidship. A steel wire line extended from a winch to a point where the boom was hinged, through a sheave, and from there to, and through, another sheave on

the end of the boom, to the sampling tool. The boom could be topped to a position extending over the port side of the ship.

It was pretty common to stick the sampling tool in the ocean floor. This put an excessive strain on the boom, causing it to bend. An attempt was made to correct the problem by welding additional sections of pipe around the boom. This had a tendency to aggravate the problem, because the boom had a greater tendency to fail of its own weight.

One of the tools was a dart, a six- or eight-foot length of 8" pipe bull-nosed down on the lower end to accommodate a 1-1/2" or 2" by two-foot piece of pipe, held in place by a set screw fitted into the coupling that held the 2" x two-foot coring tube known as a "cookie cutter." When this was dropped and stuck in the ocean floor, a sample was forced into the "cookie cutter."

The upper part, or end, of the 8" pipe was peeled down to about a 4" coupling to allow for screwing into the coupling a piece of 4" aluminum alloy pipe about 6 feet long and 4 inches in diameter. This was coupled near the center of the six-foot length in order to unscrew it to

enclose an Eastman oil well surveying instrument. The upper end of the 4" pipe was equipped with a bail to which a wire line could be attached. The 8" pipe was ballasted so that the bottom end would fall first.

The dart was, in essence, thrown overboard. It stabbed the 1-1/2" pipe into the ocean floor, thus recovering a core. After waiting for the Eastman surveying tool to take a picture of the compass disc, the dart was recovered with a core that was properly oriented hopefully.

A second tool was similar but was a long piece of steel pipe (20 feet long), with a piece of aluminum alloy on top to hold the Eastman instrument. The long piece of pipe was equipped with a fitting on the side below the aluminum section. A rubber hose was attached to this pipe. The pipe was repeatedly raised and lowered to wash its way down through loosely consolidated sediment until the rocks were in place. The object of this was to get a sample below the detritus on the ocean floor to a point where the rocks were in place, and, as might be expected with any endeavor, there were problems.

1) The locations where cores were taken were surveyed with a sextant and the accuracy limited by the

operator. When I got involved, we used a theodolite and SHORAN or LORAN.

2} It was very difficult to get a sample of rocks in place below recent, nondiagnostic material.

3) Steel wire line was used to raise and lower the tools. When slack was in the line, it fell around the tools, and the Eastman compass pointed to the wire line. Hence, the oriented core didn't work well.

4) It was not uncommon to stick your tools in the bottom. The Submarex was equipped with a boom that extended over the side. The boom was long enough that it bent under the strain. It had been repaired by adding steel to it. The extra weight of several repairs increased the weight of the boom so much that it almost bent without the added pull of stuck tools.

It became clearly apparent that the only way we could hope to get good diagnostic samples was to use a drilling system incorporating casing and rotary mud.

We stopped the sampling program and concentrated all our

effort on trying to provide the means to drill into the ocean floor from a floating structure or a ship.

In the very early stages, I was the sole member of the management team. I inherited the Submarex and her crew, Captain Tom Crawford; chief engineer, Gene Coke; sailor, Wes Toby. This was remedied shortly when I recruited A.J. Field and Hal Stratton from Unocal. Later, we added Curtis Crooke of the Maceo Corp., Russ Thornburg of Stone & Webster, Bill James, accountant, Alex, Metson, drilling superintendent, and Darlene Moon, secretary. Of course, we added many more people in time, but the foregoing were the early movers. Some of the people soon became part of a new breed -- a cross between a roughneck and a sailor.

We designed a structural steel base that fitted athwart, and extended over, the port side of the Submarex. We then designed and fabricated a small (50-foot) derrick that was set on the base and affixed thereto.

We thought it wise to hinge the derrick near the center so that it could be folded down and laid on a frame across the ship. We also provided a small drawworks, or winch, at the base of the derrick. A wire line then extended up through the derrick and through sheaves in a traveling block. In our case, the wire line was dead-

ended at a bail in the top of the block.

We had a spider we could set slips in to hold the pipe (some 2-7/8" upset, Acme threaded tubing). We used the tubing for drill pipe. There was a swivel on the end of the traveling block where we hooked the bail of the tubing elevators. We used core heads for drill bits. We also had a pump to pump mud. These were the tools we used to develop the "new" tools required to drill from a moving base. We also learned a lot about the features of the floating base. our original goal was simply to drill into the ocean floor far enough to get good, representative, oriented samples of the stratigraphy and in what was then deep water - 50 to 1000 feet. This equipment that we had come up with was, so far, our best estimate of what we might need.

In a period of, I am guessing, six to eight months from this point in time, we learned a great deal, such as:

- We learned to run and cement a conductor pipe and/or surface casing;
- We learned to circulate rotary mud in the well bore under these conditions; The conductor pipe was supported on the ocean floor from a structural steel base that was referred to as the "bird cage."

A mandrel (a piece of casing) was left protruding above the bird cage.

- We learned how to design a riser pipe between the base and the slip. An original design used a Regan blowout preventer attached to the riser on the lower end that was slipped over a mandrel on the bird cage. The inner, hard rubber sleeve was then activated hydraulically to squeeze around the mandrel, thus connecting the riser to the surface. A slip joint was required to be a part of the riser to provide for the heave of the ship.

Then we came up with several schemes to maintain tension in the riser. We learned that we could lay the pipe down and handle it automatically, thus eliminating the need for a derrickman.

As might have been reasonably expected, I suppose, we learned that the motion characteristics of the ship are profoundly important.

The foregoing led to the outfitting of the CUSS I, which proved to be an excellent tool. It drilled a lot of hole offshore, from southern California to Oregon, Washington and Alaska. She did a wonderful job.

TP: What kind of depths were you working in at this time?

RFB: We worked in water depths from 150-500 feet. We drilled into the ocean floor for coring 400 feet. These were with the use of the Submarex coring. The lawyers of the four companies said we couldn't do this. I asked them to come up with a law that said I couldn't do it; well, they couldn't. So, I kept drilling and we did acquire a lot of good data. In time, legislation was passed that said you can't drill into oil sand without a lease.

TP: Why did they say you couldn't do this? The lawyers were telling you you couldn't drill this because they didn't think there was jurisdiction in the depths you were drilling?

RFB: We would presume that if you could drill in 1,200 feet of water, there is an awful lot of oil there to be found. I am sure a good share of the oil in California was found in a drill depth of 2,500 feet.

One of the things that happened when we drilled over the side . . . we had an automatic rotary table with automatic slips, and the first time we tried it, we got the pipe stuck. We tried to pull it out but couldn't. And, as the ship rolled, the slip set. And each time

that it rolled, it rolled farther over. Finally, with the help of the ship's rolling, we got it unstuck. It appeared that it could capsize the vessel. However, the extra pull on the pipe freed it from being stuck.

We had a ship's captain then . . . I was a cowboy, not a sailor. It was an interesting experience! We had this ship's captain, Tommy Crawford. He was a heck of a guy. He was a relatively young man but he didn't look too young. He was the guy that invented the term "moon pool,[11] which has stood the test of time. I read about it every once a while -- somebody is talking about the moon pool. He was always talking about "fried ice" and this kind of thing. That is the kind of guy he was. When he came up with the moon pool, we began to see the possibilities of this type of drilling. We were just after geologic data at the time but began to see that boy, this may be the way to go because we can do it in deep water, which was what our problem was. We bought a YFNB Navy barge which had a ship-shaped hull, from Magnolia Petroleum Company for $60,000.

TP: So, when you bought this barge, you bought it with the intention that you would be drilling and not just doing just geological recognizance?

RFB: Oh, yes, we were going to try to make a drill ship out of it, which we did. But we brought it out, towed it from the Gulf to California. It had a house on it, like a big, long box. We went out to meet the tow and we took a football. One of my cohorts and I were going to play football in the house on this thing or throw it around. But it bobbed around. It was empty. And there was so much motion to it, we couldn't begin to do anything and thought, boy, how in the hell are we going to drill from this thing? Well, we did, and it was very successful.

TP: How did you convert it to maintain the stability in the water that allowed you to drill?

RFB: Well, it had to be ballasted but by the time we got a lot of machinery on it, the problem was largely solved. Part of my job was to prepare the CUSS Group for bidding on an offshore land offering. The four companies had set aside, or identified, extensive funds for this purpose. It was also my job to be sure we had the manpower, equipment and tools to develop an offshore parcel in, perhaps, relatively deep water. I made a deal with stone & Webster Engineering Corporation to provide us with an engineering group, and Santa Fe Drilling with drilling crews. Macco Corporation had a lot of construction people at the time, and they were in the act to help us

in the development of the technology, although our personal input was really more important there than the talent they had. But they were readily on tap. If we could ever get some land offerings, we had the wherewithal to go from there.

The CUSS I was where I left off, I guess. I was reporting to Howard Keck, who was one of the directors, and he had me talk to Bill Keck, Sr., who was a senior citizen then. I went to talk to him; I told him what we were doing and what we had in mind. I was amazed at the man. He knew all the sedimentary strata that we had to know, the age and all this sort of thing, by name, but he had them by a different name. He was old enough that they had been changing the names, of course, over time. He heartily approved of what we were doing and evidenced enthusiastic support.

After going through all these gyrations, the state of California didn't make any land offerings, and it was very discouraging on the part of the CUSS Group. In fact, Superior moved out of California at that point in time and went to Houston. The other three companies dissolved their relationship. At this time, I asked their permission to offer to the industry technology we had developed. They agreed, and I went back to New York

to try to secure financing. I started knocking on doors. Two places I went were Lehman Brothers and Bear Stearns. Lots of people agreed to listen but nobody would come up with action, and I wound up going back to Union Oil Company to see if they would finance me, which they did. We assumed a debt of about a half million dollars which they had incurred with the program, and they gave me about a half million dollars worth of working capital. And we got twenty percent of the equity in the new company.

TP: This was the founding of Global Marine?

RFB: That was the founding of Global Marine. And I got two fellows who were employed with Unocal to join me. One was A.J. Field and the other one was Hal Stratton. We talked Darlene Moon, secretary, and Bill James, an accountant into joining the company. Within a relatively short time, we recruited Curtis Crooke from Macco, and Russ Thornburg from Stone & Webster - both engineers.

TP: And did you just have the CUSS I at this time or did you have others?

RFB: We had the CUSS I and we had the Submarex, and one of our first jobs was to sail the Submarex down around, through

the Panama Canal and up the east coast, down the St. Lawrence River to Lake Michigan. U.S. Steel had sunk an ore barge. They had lawsuits aggregating something like $600 million and 30 people had lost their lives, drowned in this thing. Negligence was at stake. They sent a young man out to talk to us to see if we could help them. We agreed to help them for a ridiculously low charge. We had developed the use of underwater television, which was something we didn't aspire to, but had to do in connection with our activities. We took a picture of the television monitor which showed the ship. You could read the writing on the equipment and you could tell the altitude of the barge. In fact, in the first place, we found the barge; they didn't even know where it was. But they took our data and resolved the lawsuit. Then, they failed to pay us the $125,000 that they had agreed to, just orally. We were admittedly naive but lived in an industry where a man's word was his bond.

TP: They failed to pay it?

RFB: They failed to pay it. After a long time trying to get our money, they turned the bill over to a firm of admiralty lawyers in New York City. Months and months later, A.J. Field went to talk to them again for the umpteenth time and he told me that they had offered us

$25,000, and did we want to take it? I said, "No, tell them to do you know what with it." They owed us about $150,000 by now. He came back again in a little while and said, "They'll offer $50,000.[11] I said, "We'll take it." We were tired of trying to get our money. That is when we were just trying to grow and it was profoundly important to us.

Shell had been very active in the research project that we were doing. In fact, Bruce Collipp, a member of the Hall of Fame, had a sort of peripheral involvement in our effort. We did make a deal with Shell early on in Global's history. They wanted to have the CUSS I exclusively available and they agreed to pay us when they used it. When it wasn't being used they agreed to pay us, too, at a lesser rate. This helped us stay afloat to get Global started.

TP: This would have been about early to mid-1960s, or was this still back in the 1950s?

RFB: I founded the company, really, in late 1958. We started to unravel the relationship between the four companies then. I really looked upon our beginning as January 1, 1959. At the outset, it was difficult, because of Union's ownership. We were still basically just

gathering geologic data. Companies and customers were concerned about security of information. I had people convinced, but they'd transfer new engineers around, you know, and then there would be another ball game. So, in time, we had to do something about it, which we did. We made a deal with Aerojet General. We had done some government work even back in those days, and Aerojet General was a good-sized government contracting company. We had learned that you had to know something about doing business with the government. You have heard these stories about charging $15,000 for a hammer?

TP: Yes.

RFB: The reason is that they won't let you make a profit. One of the big jobs we had was installing a Polaris missile testing facility; this was way back in the early days of things. They wouldn't allow us to design it and build it, and the only way you were going to make a buck on it was to build it. So, they hired a little engineering firm in Long Beach, and we showed the engineering firm how to engineer it. And then we got the job. Nobody else had bid on it.

We recognized the security problem of Union's strong position of ownership. We also thought we needed an

experienced government contracting firm, for which Aerojet seemed qualified. With the help of Mr. Rubel, and in spite of Reece Taylor, we succeeded in selling 40% of Unocal's stock in Global to Aerojet General Corp. Ultimately, we were successful by selling stock on the open market to buy out both Aerojet and Unocal and become a completely publicly-owned company.

TP: So, when did the drill ship idea really come into its own in drilling, other than just doing core work or some of these other early jobs you did? What parts of the world were you mainly working in?

RFB: Well, one of the first jobs was offshore Trinidad. Another one was offshore Libya. Another was Cook Inlet in Alaska. And they just kept rolling in like that.

TP: And this was beginning in the 1960s? Early 1960s?

RFB: Yes, early 1960s. We made a deal with Aerojet General to take a position in the company, we told them that we aspired to grow. Further, that we were going to need money to build the Glomar II, III and IV, etc. They were a labor contractor, as most of the government contracting firms are. The local people assured us that they had money and they were owned by General Tire and Rubber

Company. If it came down to it, they said funds would be available. Well, when it did come down to it, and we had committed ourselves to build these ships, two or three of them, said, "We've got to go back to Akron and talk to General Tire and Rubber Company, our parent company.[11] Three top executives of Aerojet and I went to Akron, Ohio, the base for General Tires.

General Tire and Rubber Company was founded by W. O'Neil, who had several sons. His youngest son, who was about 40 years old then, Jerry O'Neil, was the CEO of General Tire. The morning we were to meet, he couldn't be found. Aerojet executives were looking all over for him.

Incidentally, that was the year the Dodgers moved from Brooklyn, New York, to Los Angeles. Admiral Dan Kimble was a very famous man. I think he was a former Secretary of the Navy. He was a director of Aerojet General and on the board of General Tire, a fine senior citizen. He went to one of the baseball games at the Los Angeles Coliseum, one of the first Dodger games, and sat in a box adjacent to one that was occupied by Reece Taylor. Taylor was the chairman of the board of Unocal. This was at the time we had been holding the negotiations with Aerojet to buy 40% of Global stock. I had told Aerojet that I didn't know that we could produce because Reece

Taylor was very proud of us. We had begun to make a little money, and he was having his problems with some of his directorships (Taylor was, that is). He would take out a big ad in the Los Angeles Times or the New York Times touting Global Marine. And that was another problem for me because these engineers who worked for other companies would see those ads and my phone would ring off the hook. It aggravated the problem of security of information. Anyway, at the seventh inning stretch, this admiral, Dan Kimble, talked to Reece Taylor. He said, "You know, I sure like Global Marine. I am going to buy it, or buy some of it." This aggravated Reece Taylor something terrible! In fact, he had a summer home up around Santa Barbara, and he went home after the ball game on Sunday and wrote a long letter addressed to me, with copies to every person in the corporate management. The gist of the letter was that Reece Taylor absolutely did not, under any circumstance, want to sell any part of Global Marine. The letter, several pages, was written in longhand.

End of Side A

Side B

RBF: Subsequently, Mr. Taylor called me to his office and said, "Bob, if you ever need any money, come to me. I'll put up the money." Well, that wasn't the problem. The problem was disassociating with Unocal.

TP: And that was . . .

RFB: I was authorized to sell Union's stock to Aerojet. I was to meet with Jerry O'Neil, and the General Tire people finally found him at his country club in the Akron area. We met him at the door; he had a bourbon and water in his hand and he was feeling no pain. He invited me over to a lunch table. I sat on his right, and we had just made ourselves comfortable when he said, "I understand you are back here after some money - and you can't have it. Furthermore, I won't sell my stock - well, maybe at $25.00 a share," (a ridiculously high price), "plus you get me the Union Oil tire account."

Boy that was a terrible blow because we were committed to a lot of people to build drill ships for major oil companies. We had been assured where the money was going to come from. As it turned out, we did make a deal with him, but I told him at that point in time that we were

just not on the same wavelength - we'd better talk about women or whiskey or something else! I got up and left. But we finally bought him out. That was kind of another story and the Aerojet people finally talked him into selling at a reasonable price. At this time, we went about selling Aerojet stock, which constituted 40% of the company. We were now on the New York stock Exchange

A consultant we had employed directed us to an outfit in Pittsburgh, the J.H. Hillman Company, that had been known to make these kinds of investments. They were a family company, and I went back and talked to them. They dragged out a photograph of a barge that had been used, the kind you tow to location, then set it on the bottom in shallow water. It had not worked out well; Hillman had lost money. They remarked to me that they understood I was trying to sell them on another type of offshore drilling equipment. The prospect of selling them stock looked pretty grim.

We met with J.H. Hillman at 8 a.m., and at 8 p.m., they agreed to buy one-half, or 20%, of Global. They also advised that they had worked with the J.H. Whitney Company in New York and told us to try them about buying the remaining 20% of the stock.

Benne Schmidt, the managing partner of J.H. Whitney, flew to California and met with me in Los Angeles. He wanted to see the CUSS I. We went aboard and toured the rig; we were making hole at the time.

By coincidence, we were standing behind the driller on the brake, Sonny Dunning, a big Indian, about 6¼" or 6'5[11]. He was making a connection. I saw, when he broke the tool joint, that it was going to be "wet," so I hit Sonny on the back, almost fell on him, and he fell on the brake, so we didn't get sprayed with rotary mud. The problem was that the mud column on the outside of the drill pipe was heavier than the mud on the inside of the pipe. Therefore, when you broke the tool joint on the derrick floor, the mud in the drill pipe would come roaring out and go up in the air 30 or 40 feet before spraying out all over the derrick floor -- "wet.[11] It would have covered both Benne and I (in our dark blue suits - the uniform of the day) with mud. This all happened on January 10, 1962, I think.

There was another incident. When we came aboard, I had advised the superintendent that it was Benno's birthday (incidentally, mine, too). We had dinner aboard and the cook - a big, burly, ugly bugger - came out of the kitchen with a cake in his big, old, hairy arms, singin'

"Happy Birthday," out of rhythm and off key. It was a riot! In later years, Benno retold that incident many times.

Anyway, before the day was over, he agreed to buy, in behalf of the J.H. Whitney Company, one-half of the remaining stock, which was 10%. Benno then suggested that we see Allen Shivers, former governor of Texas. I learned that Allen was going to be attending the next API meeting, so I followed him around until I cornered him privately. He bought one-half of what was left (5%) and agreed to sell one-half of that to two friends - brothers in Corpus Christi. That took care of finally buying out Aerojet General.

About a year later, we had a public offering of stock and used part of the proceeds to buy Unocal's 40% for $7.5 million. They had only loaned us $500,000 at the outset. This was too much profit to show in one year, so the income to Unocal was spread over two years.

TP: The emergence of Global Marine as an independent company from Union Oil and Aerojet.

RFB: Yes. However, Aerojet involvement was very short-lived and they made no contribution.

TP: Well, I think we are getting close on time. I hate to cut you short. Maybe we can some day finish the conversation. If you could maybe sum up, if you will, your years in the business and the main contributions you think that Global Marine made to offshore.

RFB: Global Marine's greatest contribution to mankind must include the basic technology for drilling in extremely deep water, 8,000 to 10,000 feet, or more, thereby expanding our potential oil reserves.

A second important contribution is the use of the principle of the hovercraft to transport heavy equipment, such as a drilling rig, over many areas. For example: muskeag, water, ice, etc., to drill, produce and transport oil without environmental damage.

It should be noted that Global Marine was an engineering company, as well as a drilling company. They should be credited with many government projects, with some of them being covert.

There are those who thought that Global Marine was a national asset.

TP: So, you were first into the real frontier areas around

the world?

RFB: Yes, we were first in the North Sea and all sides of Africa -- north, south, east and west, as well as South America, New Zealand, Australia, Scandinavia, Alaska, Middle East, etc. Talk about pioneers, we pioneered the drilling in all of the prospective offshore areas of the world.

TP: Well, good. I think we can conclude on that. That is good.

THE END

Offshore Energy Center – Oral History Project

Interview of Robert F. Bauer

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