OFFSHORE ENERGY CENTER

ORAL HISTORY PROJECT

Interviewee: ANDRE REY-GRANGE

Date: September 30, 2000

Place: Houston

Interviewer: Joseph Pratt

Side A

JP: This is an interview with Andre Rey-Grange on September 30, 2000. The interviewer is Joe Pratt. This is the OEC celebration of the Hall of Fame and we are talking about his role as a pioneer developer in semisubmersible technology.

I would like to start by asking you to say for the tape your basic background, your educational background and how you became involved in the offshore industry.

ARG: I graduated from the Arts et Metriers in France. It is a university specializing in medical and civil engineering. I graduated as an engineer in 1946 and then, I went to the petroleum school or what we may call university for oil and gas industry. It is part of the French Petroleum Institute. I graduated there as a petroleum engineer. In this school, we had several departments. One of them is for geology. The other one is for petroleum engineering. There is another one for engines; that is, gas and diesel engines and turbines, things like that. And there is also a department for financial and laws, as you say.After graduating from these two outfits, I started as a

drilling engineer in a company operating in southern France. That company was state controlled and it was devoted to the exploration of the southern part of France. I stayed with it for about 7 years and I had several assignments in it but mainly it ____ was drilling operations.

For some time, I was involved in the preparation of a campaign out in Afghanistan, and this was on behalf of the United Nations. But unfortunately, it did not go through because at that time . . . this was back in the early 1950s . . the USSR government did not let the United Nations get involved in the northern part of Afghanistan. This is just a comment about this particular issue.

In 1952 and 1953, I was assigned to another job in eastern France, based in Strasbourg and the purpose of the company… this was a sister company, also state controlled, and the aim of that company was to develop oil and gas resources in eastern France. I stayed with it for about six years. Then, I was assigned to another job within the same company in Africa. In Sahara. Thatis in Algeria, precisely. And there, I was the manager of that operation in which we were in a joint venture with city service of United States. This was a new opening of

operations in Sahara and we started operation down there but we were not too successful. We a couple of wells but we did not find any oil.

Back in the 1960s, I was called back to Strasbourg to open up what we called a contractor-like, that is, drilling contractor-like department. The purpose was to gather all the drilling rigs owned by the state Controlled oil and gas companies,which included at that time, SNPA, visitemm de Petroj and SNPLM which all were merged into ELF later on. Then, I started this new venture that is this drilling contractor-like company and we operated mainly for the state controlled oil and gas companies; in France, particularly, but also in Gaboon where oil and gas operations started at that time.

As a result of the Algerian indeGen ence, the operation In Sarah, that is, in southern Algeria, got into trouble and, in fact, all the French and international oil and gas companies that were involved in southern Nigeria had to back up one way or the other. It developed a fairly large crisis and in order to avoid any bad competition from this contractor-like department, it was decided to tell this department to the independent drilling contractors which were, at that time in France, Forex.

They sale took place in 1963. At that time, the French government was seriously thinking of developing an offshore activity and I was given an opportunity to join Forex and Languedociene company to form a new offshore drilling company which was called the Neptune.

I joined the company as number two below the president who was Mr. Ronald Elmas. And soon, we had to face the challenge to beat a new offshore company to operate in French offshore but also in forthcoming plane and in west Africa. After market surveying, it was decided that the first thing to do was to secure platforms. We had to comply with some of the French regulations, about the financing, because we had to get some loans from banks which were doctored by the French government and one of the requirements was that at least 75-80% of the cost of the investment had to be of French content.

Then, at that time, I made a survey of the manufacturer, that is builders in the United states. I paid a visit to several yards and particularly to Letourneau Company. We Decided that the best way to go was to secure some Letouneau platforms with the aim to start drilling operations both on Bay of Biscay and in the North Sea.

So I came to the United States and started negotiations

With Letournean company to get some kind of a building license and manage the constriction in French shipyards, in order to get this French accent. The first unit we built in France was the Neptune I, their unit which was called Neptune 1, and it happened to be Letourneau's #23 hull. Of course, there was no shipyard or fabricator in French with experience for the construction of such units, so with Dick Letourneau, we made a survey of the shipyards around France and finally, we decided to deal with a joint venture made of CFEM. CFEM is now know as Eiffel, that is the same name as the Eiffel tower.

So, we made a contract with this joint venture and simultaneously, I managed some kind of license agreement with the Letourneau Company.

My counterpart at Letourneau was Dick Letourneau. As the first unit was headed to North Sea, we had to decide the design criteria for that operation. And we had to scratch our heads because there was no reference for the environmental conditions in the North Sea, or not too many, and finally, using the weather bureau's data available at that time, we decided with Dick Letourneau to take design criteria which included 33 foot wave height. We though this was the best guess we could make

at that time. The first time of operation, we experienced in the winter, 50 feet waves. It shows that at that time, the environmental conditions were not very well known. And this is because all the data available were collected by the ships and it just happened that the sailors had not the same evaluation of the environment people sitting on the bottom of the sea.

The platform was strong enough, to withstand this extra load and the operation was very successful. But another event that is interesting to mention is that during that winter, this was in the middle of the of the North Sea that is on the U.K. side, we experienced some 30-35 foot foot scours around the legs. And this is something that wasn't experiences in the Gulf of Mexico because these scours are developed by the strong currents that take place in the North Sea. And you don't have the same here in the Gulf of Mexico. So, we had to develop some kind of counteraction, and we decided to sandbag the bottom of the sea around the legs in order to prevent the scarring.

Another interesting story at that time is that, well, this unit, that is, the Neptune 1, was ready back in 1965. Another time, it was the time when the channel tunnel was in the process of being designed. And on the

U.K. side, they tried to some core holes on the tunnel path (the protected tunnel path) and it was a failure because the core holes were made by the barge and the barge was not stable enough in order to perform the proper job.

So, the consortium who were involved in the designing of the tunnel at that time decided that it was probably good to take advantage of the first self-elevating platform available in Europe. It was good to use it to make a set of core holes. And on the way to North Sea, we stopped on the Channel and we made seven core holes which were apparently very useful for the further design of the tunnel.

The second unit that we had to build or to operate was the one devoted to Esso; that is, Exxon operations in the Gulf of Biscay . This was Neptune Gas Company and it was, again, a Letourneau platform built again by the joint venture of CFEMFL and division of Mailee that is on the Seine River mouth. This second unite Neptune Gas performed several wells on the Bay of Biscay and this again was a very interesting experience because as you know, Bay of Biscays a very difficult area to work. Obviously, for the Bay of Biscay taking advantage of the experience for the first unit in the North Sea, we took a much more severe

design criteria and we were on the safe side, I believe.

Now, soon the French oil and gas companies considered to start operations in larger water depths, particularly in the North Sea and the Bay of Biscay The depths that were considered at that time were beyond the capacity of the self-elevating platforms. So, we had to decide what way to go.

At the beginning, we didn't want to design something on our own and like for the self-elevating platforms, I came to the United States and I made a survey of the market for what was available. It was the time when Shell Oil Company developed the Blue water rig, particularly. This was back in 1965 or something like that.
It was time to buy design like we bought the designed for the self - elevating platform. We shopped around and unfortunately, we found out that there was no design available for sale. The reading contractors at that time who controlled the market . . . floating units wanted to keep the design for themselves and there was nothing available on the market. So, it was decided to start a research program to see what we could develop as a floater.

In the beginning, we were undecided . . . we had to go

for barges or ships or semisubmersibles. We may remember that at that time, we had available ships like, for instance the Global Marines. Also, Zapata had some barges and particularly, a catamaran-type drilling rig. There were other types of floaters including the huge Odeco . I don't remember exactly the name but this was one of the first semisubmersible rigs.

While we started the research program which included performance evaluation of the various floaters including barges and column-stabilized platforms. As the first assignment of a potential semisubmersible was the North Sea with very severe environment. After some evaluation of the various flow test performances, we decided the good way to go was column stabilized platforms. That is where it started.

There were two possible options for column stabilized platforms at that time. We had a column stabilized platform like the Setco triangular semisubmersible platforms and we had to show some project, that is, the Mohole project, which was developed at that time . it wasn't built but there was a lot of research work made about the Mohole project and Alan McCleary, particularly in charge of the Mohole project at that time, had designed some kind of catamaran-type platform. So, in

our research work, we had to decide whether we will go for column stabilization like the SETCO rig for the catamaran-type, Mohole-type platform.

Finally, after some research work, including test and analytical investigations, we decided that given the North Sea environment for which the first platform was meant, also Bay of Biscayne . . • the best way to go was to select a design with columns and pontoons. That is, bottle-type, let us say, floaters. And that is where it came from.

I must mention that this research work was made within a contract with the French Petroleum Institute which channeled some subsidies from the French government. As a result, the pentagon design which came out of this research work is a corner ship between the French Petroleum Institute and my company, that is, the offshore drilling company, Neptune. Then, after deciding on design, we had to start the building of it and we placed a contract for the construction of it with CFM, as I said, which is now known as Eiffel Company.

The construction of that first unit was really a challenge because there was no experience of such construction. In fact, the ship building industry's

experience wasn't very useful because the construction of these semisubmersible rigs had nothing to do with the construction of the ships. It took about 2-1/2 years to build the first unit which was called the Neptune 7 and it started with a contract with Esso for the Bay of Biscayne. In fact, it was not Esso alone, it was a joint venture of Esso, that is Exxon, and ETF, that is the group of companies merged into . The first operation of that pentagon took place in the Bay of Biscay. Later on, it moved to the North Sea where it had a very good performance. In fact, there were already at that time a couple of other semisubmersible rigs operating in the North Sea, and we may say that the pentagon rig was performing very well.

Just for the history, when we settled the design criteria, we used particularly for the wind, we used 100 knot wind speed. In the second and third year in operation in the North Sea, one day I was on the pentagon rig and we were caught by a southeastern storm and there again, we experienced winds higher than the design criteria; that is, we experienced winds of 110 knots that day. The waves weren't too high or too frightening, but we had that day some 18 meters in height, with the top of the waves completely breaking. It was fairly scary, I'd say. But it was O.K. for the platform.

After building the first pentagon rig, CFEM, taking advantage of information that she had gathered on it, took six other contacts for sister ships for international concerns. Ourselves; that is, Neptune Offshore Company, but in the meantime, we were taken over by the Schlumberger group. It is a little bit complex but roughly, we must say that we were at that time in the Schlumberger group.

Being with the Schlumberger group relaxed the constraints about the French content, I must say so, and as a result, we were mainly concerned by cost. So we put out an inquiry for the construction of the second unit in several shipyards around the world and it turned out that the best deal was from Letourneau which, at that time, had become Marathon Letourneau, and Marathon Letourneau wanted to start the construction of semisubmersible rigs using a new shipyard at Brownsville, Texas. So, we placed the contract to Marathon Letourneau for the construction of that rig in Brownsville, Texas.

Interesting to note is that this yard, which was brand new, had no formal experience and, in fact, the Letourneau experience at Vicksburg, Mississippi was not too useful because their experience was mainly for self-elevating platforms. So, we had to develop the experience at Brownsville.

The third unit that we wanted to build . well, the second unit which was called the Pentagon 82, headed to the Hudson Bay in Canada. This was the first assignment. Unfortunately, the delivery was late and we couldn't make the Hudson Bay job the first year because the Hudson Bay was open only in the summer time and as the platform came out some time in July, it was too late to make the Hudson Bay for such a short period.

Then we started operations in the North Sea for Coneoco. We came back to Hudson Bay the following summer. In order to get into the Hudson Bay. We had to reinforce the pontoons in order to withstand the ice flow. This was something unusual and something unique.

The third unit we had to build was built in Finland There again, the selection of the Ravma Repola shipyard in Finland was the result of an international Invitation to bid for the construction of that unit and it turned out that this yard was the best one price-wise at that time. And there again, it was an opening of a new yard because they couldn't build that unit in one of their existing shipyards and they had to build the facility to build semisubmersible rigs. So, we were the first customer in that shipyard. Later on, they built lots of other units including semisubmersible rigs and

that is where they started their experience.

Well, that is about all.

JP: Tell us a little bit about the design problems with the new technology and how they were worked out, or the theory behind it - why you chose this design and then what had to be done to it.

ARG: As I said, as far as the overall shape is concerned, we had a choice between catamman-type platforms like, for instance, the Mohole design, and column stabilized platforms. When I say "column stabilized," I am referring to a design in which the floaters are made of independent, if I may say so, columns and pontoons. These floating bodies are tied to each other by a bracing network. Finally, we decided to go for independent floaters or column stabilized because, according to the time test and according to the vertical analysis, this kind of configuration showed to be more stable, showed to be less sensitive to the environment, to the waves particularly.

For instance, in our time test, in our research work that We made, we showed that for a given wave period, which happened to be in the range, a body made of column

and a pontoon has response in the wave which is practically nil. It is what we call . if we properly design the ships and the size of the bodies, we may practically control the point that is the wave period in which the body doesn't heave. And this picture was considered as a definite advantage in order to develop a floater that would be properly designed for a given area such as the Bay of Biscayne or the North Sea.

JP: What water depths were these original designs up to?

ARG: Originally, the first platform was designed for 660 feet of water but soon after the beginning of the operations, we had to face larger water depths and the mooring system was increased to meet some 1,000 feet water depths. It was quite a large water depth at that time.

JP: Did that move require much adjustment of the design?

ARG: Not really. The two areas which are concerned about the water depth are the mooring system which was a static mooring system at that time as opposed to the dynamic system, and the riser suspension system. Obviously, the larger the water depth, the more complex and stronger must be the riser suspension system. Otherwise, the body is not very much affected. That is, the body is not very

much affected by water depth.

JP: Were you the first in the market with this design and did others follow quickly when it proved successful?

ARG: Well, we were the first with the pentagon design but simultaneously, Setco; that is, the line of column stabilized platforms which were called A, B, C, D, etc., which were, in fact, using the same general principle. Simultaneously at that time, there were other designs available but not for sale on the market like, for instance, the Odoco big platforms which were used in the Gulf of Mexico. There was also initially the Blue Water rig used by Shell Oil Company in the Gulf of Mexico.

JP: As we conclude, are there any general observations you would like to record for people who are, in the future, interested in the development offshore, about the industry itself?

ARG: Well, today, there are two lines of floaters for large water depths. We see on the market some shipshape floaters and we see column stabilized platforms. There is competition between the two but there is probably field application for each one. And we must say that for harsh environments like, for instance, the North Sea or

Bay of Biscayne column stabilized platforms are likely to be the way to go. For milder environments like, for instance, Brazil or West Africa where there is a lot of work to do at this time, shipshape floaters are probably good enough. Does that answer your question?

JP: Yes. Well, thank you very much.

THE END

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