

equipment and personnel from NIDC, and we can exchange ideas.

● Would you please explain about those areas which you can use your experiences?

- We have identified some areas like pumping, cementing, well testing, directional drilling, finishing operations where we can work together with NIDC. In fact, last week we had a good and fruitful meeting with NIDC and I think, we will see some progress happening soon between the two companies, and this is really to provide services jointly to the international companies that can be beneficial to both companies.

● In what regions of Iran have you worked or you are going to work in future?

- We are working in all regions of Iran. We have an operational location in Ahwaz which has been there for a very long time. We have another operational location in Bushehr which covers mainly our offshore operations, and we have a location in Khangiran which is in northern Iran. At the moment, there is little or no activity in the north, but we

are prepared to kick off the operations, when the activity picks up.

● So you have worked in different parts of Iran, and what about the Caspian region?

- In Caspian, we await the start of drilling operations.

● Do you see a better prospect for your activities in Iran?

- We are very optimistic. We see a good future not only for Schlumberger, but entirely for Iranian oil industry.

● What type of agreements do you use?

- We have service contracts, we are a service provider to buy-back projects. We do not do buy-back.

● Do you work all over the world?

- Yes, Schlumberger works in more than 100 countries.

● Which regions are more important regarding the concentration of oil reservoirs in the world?

- The most important regions for us today, in terms of concentration of the

oil reserves, is the Middle East. In North America, we have a lot of activities and that is not only because of the oil reserves in that region, but it is also due to the nature of the work there. They have a lot of drilling rigs, a lot of operations going on, but mainly it is the Middle East and the United States.

● What about deep sea operations, in regions such as the west coast of Africa, Nigeria ..?

- We are very much present in these areas. We have been in the deep sea market for a long time, through Sedco Forex, that was part of Schlumberger group. Sedco Forex was one of the pioneers of deep sea drilling, and today it is part of Transocean. We are expert in drilling or deep sea services like subsurface safety valves and drill stem testing operations in deep sea wells.

For certain services it is different. It is, for instance, more difficult to test a gas well than it is to test an oil well, but drilling is very similar. A few methods will change, like the type of fluids, the concentration of fluids used to drill the wells and from well control point of view it is more difficult to control a gas well than to control oil wells.



contractors in many other aspects.

● **What is the amount of your share in Iranian projects?**

- It is difficult to say, because it depends from one service to another. I would say in the area of well logging for instance, we have a market share of about 30% considering the fact that National Iranian Drilling Company NIDC is one of the other providers of the services.

In others it is different because it varies throughout the contract life.

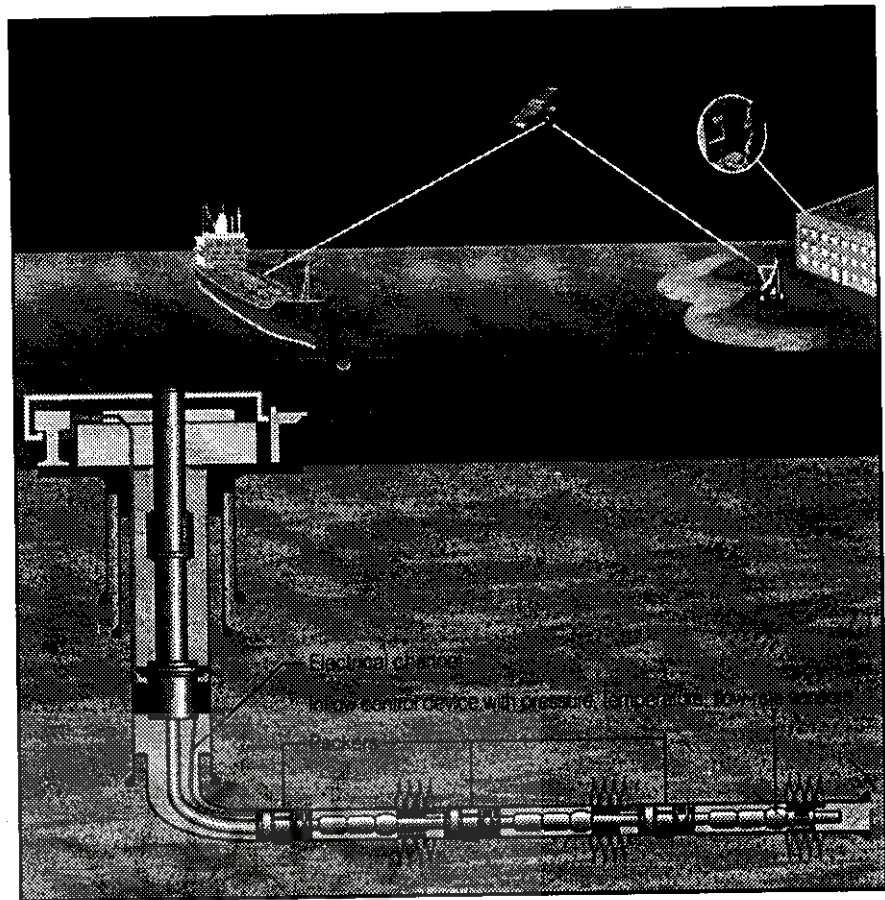
● **In your opinion what's the advantage that you present for your company in comparison with others?**

-What we provide in the Iran market is really the technology. What Schlumberger has always strived to do was to provide new technology to find better and cheaper solutions in the oil and gas industry and. For instance, this year we have upgraded all of our acquisition systems in Iran to the latest technology available anywhere else in the world. We have brought our latest imaging tools in order to be able to provide better information on reservoirs and hence make better decisions. What our customers look for is the cheaper solution, even if the use of new technology may cost a little bit more in the short term, but what technology can save them is tremendous.

● **And this is one of the latest technologies?**

-Yes, this is one of the latest technologies we have and this is basically multilateral completions. Our customers initially drilled the oil well that was vertical drain and then they produced oil from certain layers. Now, directional drilling has come into picture combined with horizontal drilling. Today what we do is multilateral.

● **So it is not completely**



horizontal?

-We do drill horizontal wells. First there is a vertical well, and then we deviate the well toward a horizontal one.

● **What's the difference between horizontal and directional?**

-It's the same thing excepting that the angle is different. The directional well starts vertical and then goes at an angle until it becomes horizontal. Today, this technology allows our customers in one well to complete the well in different directions instead of drilling several wells. They just drill one well and then at the bottom they go to horizontal drains or they can complete it in different layers.

● **Who uses these techniques in Iran?**

- Today Schlumberger uses these techniques. We have the latest technology which is available anywhere in the world and it is available in Iran

today.

● **You are both working on offshore and onshore?**

-Yes, we work both offshore and onshore. The techniques are similar. We are very active with offshore, while we work onshore as well in conjunction with NIDC.

● **So the most part of your activity is on offshore Iranian reservoirs.**

-Both land and offshore. And as I said, we have a good level of cooperation and understanding with NIDC, the National Iranian Drilling Company, as well.

● **How do you cooperate with each other? Do you have a defined program for such a kind of cooperation, so that everyone is doing his own part without overlapping?**

- Exactly, there are certain areas we can do services, we can utilize

# Schlumberger, an old hand at oil fields

*Schlumberger Ltd, the world-famous oil field services company, has been active in Iran for several decades. The company's activities cover a full range of oilfield-related functions including seismic survey, drilling, well cementing, well logging, etc. General manager of Schlumberger's office in Iran Fadel Fellah explains about the company's activities in the following interview.*

● We know that Schlumberger is an old well known service company. Would you please explain about your activities in oil and gas and particularly about your activities in Iran, recent contracts or things like that ?

-Schlumberger is a company that has started several years ago, the origin goes back to 1911 when Schlumberger started as a logging company at the very beginning. Today, however, Schlumberger is a completely different company. We started from the seismic surveys to the drilling; to provide all the services required to drill and analyze the information coming from an oil well just to assist our customers to provide a complete solution. In our services that we are providing today Schlumberger has strived to produce new technology to assist our customers to find oil and gas much cheaper compared to the past and of course produce cheaper oil. Then, this is our activity worldwide. Seismic surveys, drilling, well cementing completion, stimulation, well logging are the type of services performed by Schlumberger. We do the well testing and also we do data management and interpretation with our GeoQuest. Schlumberger has been in Iran for 65 continuous years now. Importantly as a foreign company in oil sector, we had a permanent presence in Iran, so we

have not left Iran during the days of the revolution and even the war with Iraq. We feel as the part of the Iranian oil industry and we hope that we will continue to be part of the Iranian oil industry for the next one hundred years.

● And if you have got any recent agreements with Iran, would you explain about them?

- We have contracts with NIOC for nearly all the services that we provide, so we have a service contract with one drilling rig which is drilling for NIOC exploration. We have a contract for Wire line on logging for all of the NIOC managements, that is, NIOC exploration, NIOC off share, NIOC south, NIOC central. This contract covers all of them and under this

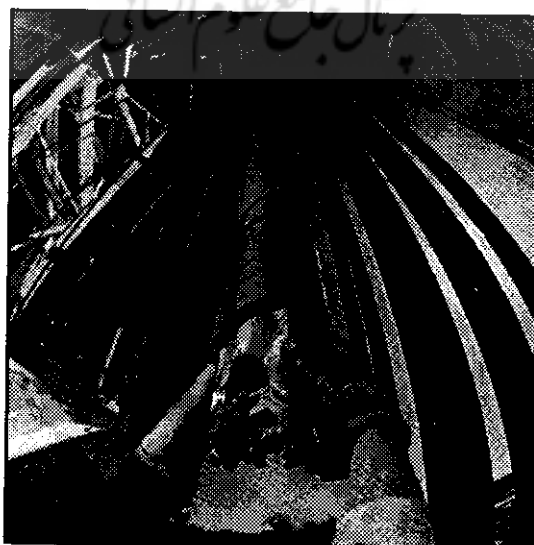
contract we provide well logging services, well testing services, perforating services and we also provide logging while drilling and other associate services. Then we have contracts for cementing oil wells with NIOC exploration and NIOC off share. We have contracts for directional drilling and measurement while drilling also with NIOC. We have contracts with POGC, which is Pars Oil and Gas Company, and for this company we provide a complete range of services including the project management. We have a team to assist Pars Oil and Gas Company to manage the drilling operations on the rigs.

● What about Total and other companies like Petronas?

\* Today we are working only with the national companies, because international companies have not started yet. With Total in Total South Pars, We have done work for them for the first phase. We are working for Pars Oil and Gas Company which is basically an Iranian company. We work directly for them, and also we provided services for Total in Sirri.

● Are you the main contractor in this field in Iran?

- I would say we are the main contractor in Iran. There are other





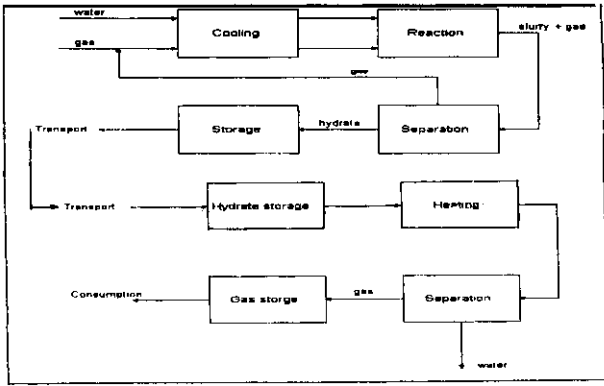


Fig 3 - Process diagram for hydrates production

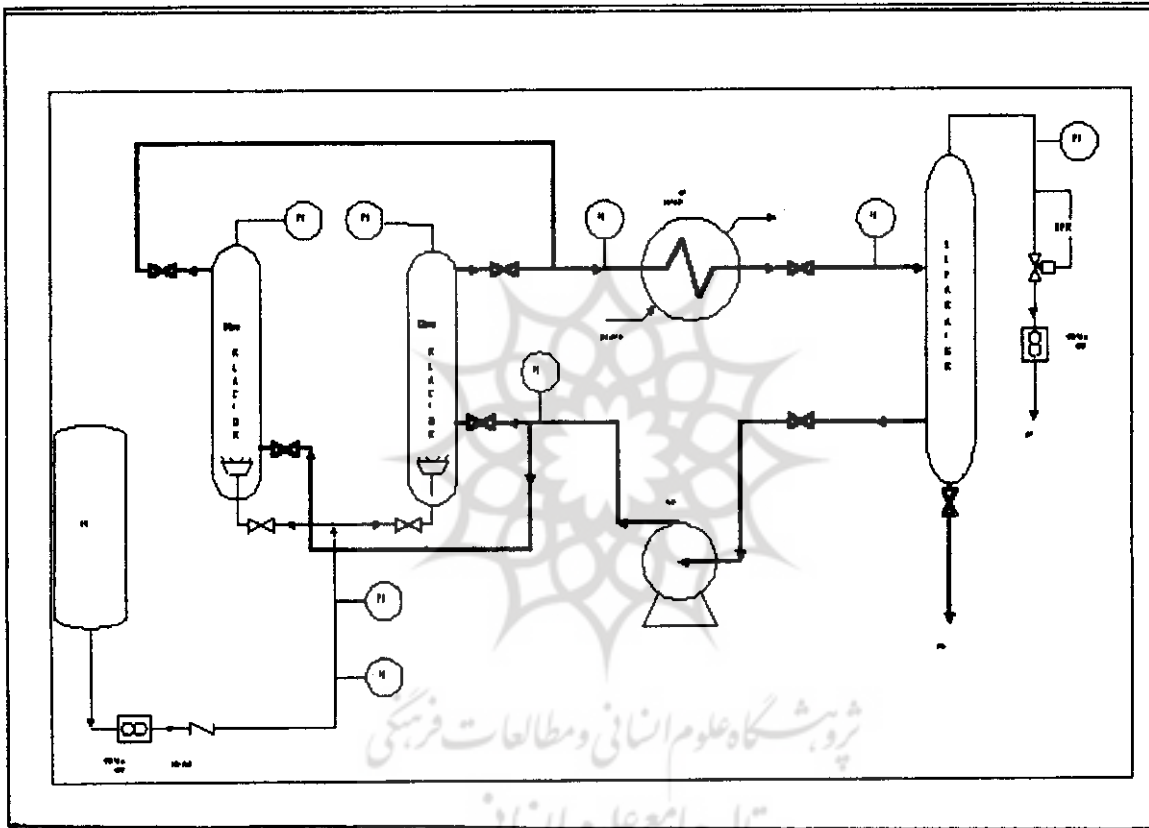
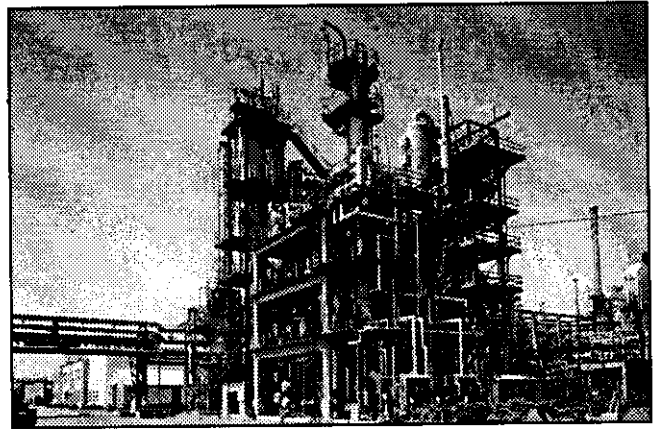


Fig. 5 - Ripi setup for hydrate formation

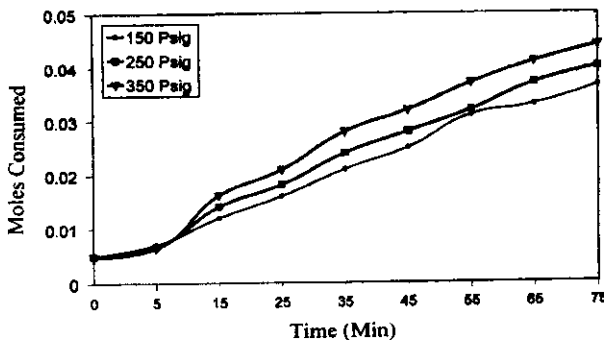


Fig. 6 - Ethane hydrate kinetics result at various pressure (Temp. , 277 K)

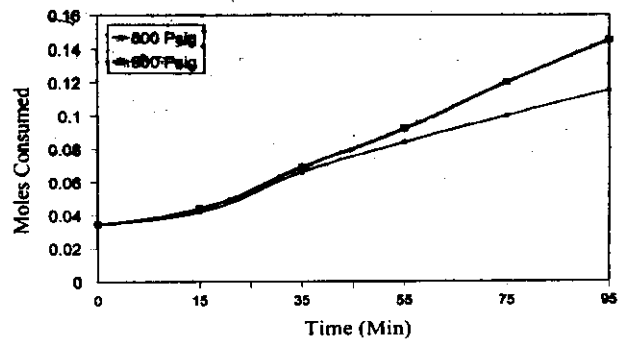


Fig. 7 - Methane hydrate kinetics result at various pressure (Temp. , 279K)