MISSOURI S&T

UMR Journal -- V. H. McNutt Colloquium Series

Volume 2 Article 9

June 1971

Drilling Problems Associated with Arctic Minerals

Robert L. Parker

Drilling Problems Associated with Arctic Minerals

Robert L. Parker
Parker Drilling Company
Tulsa, Oklahoma

ABSTRACT

With major involvements in Alaska, the experience gained from these operations reflect the success of talented personnel in meeting the challenges of climate, equipment, logistics, perma-frost, etc. Real concern stems from present delays in the Arctic program due to financing involved as well as increasing dependency of the United States upon these reserves in today's market and supply situation.

It is difficult to conceal our enthusiasm for Alaska. Drilling people are independent, aggressive, adventuresome, exciting - so are Alaskans. We have found the State of Alaska and its people to our liking and we hope very much to be a part of its future. Our company has been drilling for the Atomic Energy Commission on Amchitka Island far out in the Aleutian chain for several years. We also have five drilling rigs on the North Slope of Alaska. We are interested in the total state of Alaska and not just in these specific areas, and we own a substantial interest in Alaska Airlines as well. These investments commit our company's future to that of Alaska's quite strongly. These represent over one-third of the assets of our total company when you consider our equipment, our personnel and our support equipment involved. We suspect that proportionately to our total worth, our company is committed to Alaska as much or more than any other oil industry company we know. Obviously we have been substantially affected by the delays in these programs of Alaska in recent months because of the size of our investments there.

Challenge is the best way to describe the drilling problems involved. The climatic conditions on the North Slope almost seem to resent human beings. The bitter cold, strong winds, flat barren land, ice and snow, combine in many forms to produce white-outs and other conditions that are not conducive to efficient operations. In the winter it is frequently impossible to determine where the horizon is as well as to distinguish the sea from the land since all is white and all is ice.

For these and other reasons the companies operating there chose from their ranks their top personnel. This includes drilling contractors as well as operators. The problems simply demand the best people, and Alaska has benefited from the capabilities of this talent tremendously.

The equipment and facilities required for drilling in these conditions involve basic hydraulic systems for soft rock drilling, simple rig-up designs, special cold steels, elaborate heating and living facilities, stringent safety programs, and special procedures to prevent pollution or contamination of the area. The drilling operations are affected by the seasons involved. During the freeze up or winter months, it is quite simple to move long distances in nearly every direction. Such a long move usually requires five to ten days of time before spudding. This compares to 24-hour moves on drilling pads. These operations can normally be carried out between the approximate dates of November 15 and June 1. During the summer months the drilling equipment must depend upon the road systems presently being developed, or be on a new location prior to the thaw, on a multiple pad location for summer drilling, or utilization of helicopters, etc.

As in most cases, economics are a major factor in determining your pre-planning and scheduling for these periods of the year. The drilling techniques themselves vary somewhat with the different operators and the more specific details of these techniques are still restricted. In general, however, we set 250 feet of 20 inch casing and then drill through the permafrost with extremely high viscosity mud (150 viscosity) at a very low temperature (35 to 40 degrees) to 2,250 feet where we run 13-3/8 inch casing. The 9-5/8 inch casing is usually set around 6,000 feet, and 7 inch casing to total depth, if required. Of course this is just one typical pattern of which there are many variations. The development programs now require about thirty days drilling time to 10,000 feet, which is a tremendous improvement in the last few months. The average time to 11,000 feet runs from 30 to 45 days. A recent well to 16,000 feet required only 150 drilling days, which is faster than most drilling in the lower states. There are very few hard rock conditions encountered and there are no special new tricks employed to drill on the Slope. Basically we simply utilize the latest type of drilling bits, the best hydraulics available, with good drilling rigs. We run about 40,000 pounds of weight on the bit at 50 to 75 RPM. Without a doubt, the success that has been accomplished in the drilling programs to date on the Slope are the result of teamwork of everyone involved. These

results have been astounding. There have been more improvements made in drilling progress on the North Slope in the past year than in any other area of the world with which I am familiar. The challenge I spoke about earlier is what made this possible because challenge brings out the best in men and the quality of people that have been assigned to these operations, coupled with these challenges, continue to produce the results being realized there.

Most of what I have said is common knowledge. There is still much information about the Slope that cannot be discussed because of the importance of information to future lease sales and programs. However the untold story is perhaps not well enough known of operations on the North Slope. We prepared for the problems mentioned above - cold, wind, permafrost, etc. The problems that continue to exist are those of logistics, remoteness and support.

Since financing has become such a critical issue in all of the world today, it is even more accented on the North Slope because of the high cost involved. Therefore the logistics become a major concern to all involved. The alternatives are few as to how to provide the equipment when and where it is needed without tying up large sums of money needlessly. The remoteness of the area is hard to appreciate until you start maintaining supply channels. The overhaul and maintenance of your equipment itself requires special planning and transportation. There is a fantastic dependence upon air support and pre-planning of the maintenance of that air support has been a major criterion for the success of these operations. I could mention the ice fog hazards and the numerous occasions when it becomes necessary to work outside of the protective areas on the North Slope despite the elements to accomplish the necessary jobs. "Tight" holes continue to be the rule on the Slope and they in themselves bring a different style of operation to this program in many ways. One simply has to be security conscious in addition to his other functions.

The importance of the future of the arctic areas of Alaska has been brought more into focus by recent developments in the Middle East in the past few weeks. These reserves have become of much greater value in view of the new structure and prices of Eastern Hemisphere oil. The drilling operations themselves will undoubtedly continue to improve as these programs do progress and as soon as more definite planning can be made with known objectives.

There is a real danger to the success of the program in that the delays presently being encountered could well shift the priorities of the companies involved to other areas. There has been some evidence of this already. These key people I have mentioned earlier who have been responsible for much of the success accomplished could be transferred to other areas that are more active, which would take from this operation the top know-how for further advancements. Reallocation of operational budgets is an equal threat to this shift in priorities as well as a change in the total market picture due to the uncertainties of the availability of these reserves. There is an urgent need for immediate reactivation of the total program to recapture the momentum of success which is so vital to the State of Alaska and its people, the replenishment of the rapidly declining supply of oil and gas to the United States, and the multiple benefits of position in the energy markets as well as the importance of world security to the citizens of our country.

In concluding, it is obvious that drilling problems in the arctic areas of Alaska are really a matter of how efficiently they blend into the total operational effort than the actual drilling techniques utilized on the wells.

Robert L. Parker

Robert L. Parker is President and Chairman of the Board of Parker Drilling Company, Tulsa, Oklahoma.

He attended Culver Military Academy and The University of Texas from which he graduated in 1944 with a degree in Petroleum Engineering. He was a member of Pi Epsilon Honorary Petroleum Engineering Society.

He is married to the former Catherine Mae McDaniel and they have three children, Bob, Carol and Debra.

After serving in the Armed Services during World War II, he joined Parker Drilling Company in 1947 as a roughneck on their rigs in Mississippi, advancing through the company as toolpusher, safety supervisor, vice president and president.

He is the former World's Open Skeet Champion as well as being a member of several All American skeet teams.

He serves as a director and trustee of several institutions, including the National Bank of Tulsa, Home Federal Savings & Loan Association, The University of Tulsa, John Brown University, First Methodist Church, St. Francis Hospital, and Comptran Corporation. He is active in many civic capacities, including YMCA, Boy Scouts, Junior Achievement, Economic Education, etc. He is the author of numerous articles and technical papers as well as filling numerous speaking engagements.

In 1967 he was awarded the Doctor of Laws honorary degree from John Brown University and in 1969 the Distinguished Engineering Graduate Award from The University of Texas, which is the highest award this college can bestow.