

R&D: the Russian advantage

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ANDREW GOULD received his degree in economic history from the University of Wales. He also holds an honorary doctorate in Engineering from the Colorado School of Mines and is an honorary Fellow of Cardiff University. Mr Gould joined Schlumberger in Paris in 1975 after working for Ernst & Young, where he qualified as a Chartered Accountant, and went on to hold a number of senior positions in the company and its subsidiaries before assuming his current position in February 2003.

Schlumberger first came to Russia in the days of the Soviet Union in the late 1920s when the company was only a few years old. From the beginning, Russian engineers were hired and trained and electrical surveying operations run in various parts of the country until 1937. A long period of absence followed until a return in 1990. It was touching then to find that even after a sixty-five year absence a portrait of Conrad Schlumberger was still hanging in the Gubkin Oil and Gas University in Moscow.

On our return our initial beginnings were difficult. We could not get substantial business, and the attempts of the international oil companies to penetrate the Russian market were small and slow. Logistics were complex and operating practices different. Our big opportunity came through customers who wished to try new and different methods to exploit older fields in Western Siberia. The results were extremely successful and spectacular production improvements followed. By then we had no doubt of the future importance of Russia for Schlumberger, so despite the perceived risk of investment we decided to make a series of commitments that would make it clear that we were in the country for the long term.

We had already begun to hire significant numbers of Russian engineers. We had also begun to seed research programmes at many academic institutions across the country to select those that would be best suited to our technical needs. We opened a small research laboratory on the campus of Moscow State University, which provided us with excellent access to both students and faculty. This centre has now moved off campus, but is at the origin of our Moscow Research Centre which employs 53 engineers and scientists. We subsequently opened a technology centre in the Siberian city of Novosibirsk, the home of Akademgorodok, a centre of Russian science where we now employ 93 people.

We built two manufacturing plants in Tyumen, a Siberian city at the heart of the oil and gas industry. But perhaps more importantly we also built a very large training centre to serve the needs not only of Russia and the former Soviet republics but also increasingly to meet many of the training requirements of other European countries. The centre caters to many different disciplines for our employees and for our Russian customers.

We had also been fortunate enough to have been

able to invest in a series of service companies in Russia whose technology, practices and workforce have been particularly adapted to the Western Siberia market. Their technology is fit-for-purpose and their knowledge of the problems associated with production in Western Siberia is far superior to ours. When we combine their skills with advanced technology developed in other parts of the world I believe we have a winning combination.

Our position in Russia is now as a strong provider of services in the three principal markets. In Western Siberia our activity is supported by the knowledge acquired through our investment in Russian oilfield services companies. This has helped tailor our service delivery to the high-volume nature of Western Siberian operations. In Eastern Siberia, where frontier exploration and development requires the use of more advanced technology, the traditional Schlumberger product lines play a greater role while in Sakhalin, the offshore activity of both international and Russian customers requires use of advanced technology – particularly in extended-reach drilling and sophisticated well completions. But common to all areas has been the recognition from both customers and authorities of our commitment to invest.

Russia today is a major producer of oil and natural gas. Globally, it is well known that recoverable reserves equal, on average, up to only 30 per cent of explored reserves. That is to say, twice as much oil is left in the ground than is produced and there is no reason for this general rule not to apply in Russia. However, according to many authoritative estimates, an additional 20 to 45 per cent of oil in place can be produced from mature oil fields. We can, and should target these hydrocarbons because easy-to-recover reserves are receding into the past. But to do so, we will have to work harder and harder to produce each new tonne of oil, and each new cubic metre of gas. And we will have to do this not only in the field, but also, and even more importantly, in laboratories and research centres. Today, in our view, only the search for new oil and gas production enhancement methods, and the corresponding development of new technologies will help both the global and the Russian energy industry to be more efficient.

Let me give you just two examples from daily operations in Russia. First, a high-technology rotary-steerable system, that operates 30 per cent faster than

traditional downhole motors, was used in one of the Northern fields to drill three wells. According to our estimates, this system saved three weeks of rig time and about 45 million rubles. In fact, the saving equalled the drilling of one additional well with all associated energy and financial costs. Second, a new hydro-fracturing technology, based on fibre materials and used in Western Siberia last year, increased well productivity by 6-8 per cent over conventional hydro-fracturing methods. These numbers are substantial, when applied to an entire field.

We are already seeing that the major oil and gas operating companies in Russia are paying increased attention to the search for new and enhanced recovery methods. And we are perfectly conscious of our mission: we are investing in Russia to help our customers to be more efficient, and produce more oil and gas in less time, with less money and, of course, by consuming less energy.

New production enhancement methods can be found through active investment in research and development. In this regard, it is important for us as an international company to import and transfer the best world technologies to Russia, as well as develop in Russia new technologies for both local and global application. It is important to emphasise that, in spite of the economic crisis we made the decision not to reduce our investment in at the height of the global recession, we still spent almost the same amount on research and development as we did the previous year. In Russia alone, we invested around 65 million dollars in research and development and I would to emphasise that our cooperation with Russian institutes and universities is based on equal and mutually beneficial agreements. As of today, there are about 40 such agreements with more than 30 educational and research institutions.

By way of example of the new technologies being studied, I mentioned earlier a new, efficient hydro-fracturing technology based on fibre reinforcement. This technology was developed in Russia two or three years ago. Today, the Institute of Computational Technologies of the Siberian Chapter of the Russian Academy of Sciences is working on an improvement to this product in cooperation with our Technology Centre in Novosibirsk. It is planned to use the resulting product in the future not only in Russia, but also elsewhere in the world.

In another field, the Institute of Nuclear Physics in Novosibirsk Akademgorodok has been working for over a year on the development of a high-technology logging-while-drilling tool with much better measurement accuracy and shock resistance than tools commonly used today. This project is planned to take two and a half years. And in computing, as a result of joint research with scientists from Moscow Institute

of Physics and Technology, many complex reservoir simulation software products can now be migrated to super-computers with a completely new architecture, thus increasing their performance by many orders of magnitude versus their counterparts based on traditional CPU architecture.

Elsewhere, the latest 3D sonic logging tool simulation software was developed by researchers from St Petersburg State Polytechnical University. And after its capabilities were demonstrated in Japan, engineers from that country repeatedly came to Moscow and St Petersburg to learn how to operate this equipment. Lastly, a joint experimental laboratory was set up as part of our long-term cooperation with Moscow State University. Researchers, postgraduates and students from the University use the most advanced equipment to work on research topics that are identified jointly as part of our partnership. This laboratory is currently focused on developing new enhanced oil recovery methods based on nanotechnologies.

The development and deployment of breakthrough technologies in combination with the implementation of innovative solutions is core to Schlumberger. However hard hydrocarbon reserves can be to recover, there will be solutions and technologies to make it possible. From our experience as an investor in Russia and from our research partnership experience with Russian research and development institutes and universities, we know that, after hard years of work, there will be more and more Russian contributions to the international oil industry and more and more Russian researchers and engineers ready to work in the oil industry in Russia and worldwide. **F**



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