Whatever Happened to the Skills Crisis in the Oil and Gas Industry?

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During the years leading up to the financial crisis of 2008–09, growing skills shortages were one of the main concerns of the oil and gas industry. A 2007 study by Cambridge Energy Research Associates estimated a shortage of 55,500 engineers and project management staff to deliver the more than 400 major projects that were then scheduled to come on stream over the next 5 years. A 2008 Ernst & Young survey showed that nearly 90% of senior human resources executives at 22 top international oil and gas companies thought the industry faced a major talent void and they called the problem one of the top five business issues facing their companies. Several research institutions even ventured to calculate the cost of skills shortages for the industry, and one of the more conservative studies estimated that the US oil and gas industry alone lost between USD 4 and 5 billion in 2006 as a result of the skills shortage.

A number of oil and gas executives argued that if nothing is done, there would be a slowdown in reserve replacements, a "capacity shut-in," and a major increase in operating costs within the next 5 to 10 years. Already, during 2007 and early 2008, reports were coming in of project delays around the world because of the lack of skilled personnel.

We all know that that situation has changed since then. Crude oil prices plunged from more than USD 140/bbl to under USD 40/bbl as the global recession reduced energy demand in the importing countries. And the demand for higher-skilled workers dropped as production declined and producers cut capital expenditure on exploration and new production facilities. The outcome is that many companies and governments, which had developed plans to invest in human resources to tackle the skills shortage, have decided to drop these or scale them down significantly.

This raises an important question: Once the current recession is over, and the industry gears up to meet growing energy demand, will it again be faced with skills shortages restricting production? Clearly, smaller energy companies with limited access to capital have fewer options. But the larger ones with more capital, does it make sense they drop human resources from their investment plans?

Several large companies are already positioning themselves for the recovery. They have maintained or even increased capital expenditures to be able to meet higher demand in the future. But what we have seen so far is that these plans only cover capital investment in production and exploration. So far we have not seen any major plan to address the potential of future skills shortages once the industry gets ready to meet higher energy demands. In our view, the industry risks paying a high price if it ignores the threat of skills shortages limiting future production.

How to Avoid Skills Shortages After Recovery

The Centre de Recherches des Enterprises et Sociétés in Geneva recently completed a review of the human resource situation in the global oil and gas industry based on numerous studies. This initiative was funded by Afren, the Nigerian oil company, and sponsored by the United Nations Institute for Training and Research.

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The central finding of this study was that the skills shortages that had built up until the recent global recession were not simply the result of growing energy demand in China and India and other emerging economies. Another cause was the decreasing supply of trained engineers, geophysicists, and other high-skilled workers. The study proposed a three-point global plan to ensure that supply meets demand.

More Training. There is an urgent need to expand training programs in Europe and the US. The number of oil-and-gas-related courses has declined substantially over the years, and companies can play a useful role in linking with universities and other learning institutions to reverse that trend.

But training also needs to expand in low-income countries, particularly in those with oil and gas reserves. Going that road is often seen as too big a challenge because of the lack of an adequate infrastructure and scarce teaching personnel. But the counter-argument is that the risk of another skills crisis is too important to ignore the possibilities of offering training in countries with huge populations of young people eager to have access to training and jobs. Recently, a few successful initiatives have been developed to establish new centers of teaching in low-income countries, often in close collaboration with oil companies, universities, and training institutions of high-income countries. It is essential that more such initiatives are undertaken.

Increasing the number of training courses within companies is also a requirement. One recent survey found that more than half of the companies interviewed felt that improved in-house training is more effective than keeping older workers beyond their retirement.

Attracting More Students. The number of students in petroleum-related courses in the US and Europe has declined significantly over the years. As quite a number of observers have pointed out, there are some fundamental differences in priorities and preferences between the generation of professionals now exiting the industry and the so-called Generation Y. This generation is the population in western industrialized countries that currently range in age from recent university graduates to middle-school students (generally, birth years from 1982 to 1993). Generation Y tends to aim for long-term career development, variety of experiences, a sense of purpose and meaning in their work, open social networks, and a favorable work/life balance. Oil and gas companies need to address these issues, otherwise it will fail to reach this generation.

Deloitte consultants has proposed a strategy for getting young people involved in the Develop-Deploy-Connect Talent Management framework. Companies "develop" prospective young workers by providing them with active learning opportunities; "deploy" them by designing effective organizational environments; and "connect" them by creating infrastructure to foster collaboration.

The strategy should not be seen as a tactic to produce quick fixes, but as something that companies need to incorporate into the underlying values of their organizational culture. It is not only that the industry needs to do work to change the image of the industry among the young generation. It also needs to adapt the corporate culture, job content, and work methods more to the interests and concern of this generation. The two should go hand in hand.

Revamping Recruitment. Besides more training, there is also a need to overhaul recruitment procedures. Traditionally, the industry has sought to hire primarily males from either the US or Europe with degrees in petroleum engineering and related disciplines, and with at least several years of experience. This pattern now has to be broken. The oil boom before the 2008–09 recession already saw more recruitment of women, of recent graduates with little or no experience, and of people with degrees in other disciplines. There was also an increase in recruitment from countries other than the US and Europe. But the numbers involved are small; nonconventional recruitment can be expanded considerably.

The industry can reduce its skills shortages with a strategy to draw more professional women into employment. Developing such a strategy will not be difficult given that women constitute a significant proportion of students enrolled in engineering courses. The number of women in engineering is high in such countries as Egypt, Indonesia, Libya, Malaysia, and Turkey. In some Asian countries, the proportion of women and men is approximately equal. At Kuwait University, female students now make up the majority of students working toward petroleum engineering degrees.

Another means of reducing the shortage is to retain staff beyond the normal retirement age. Early retirement can be limited, retirement dates can be postponed, or retired employees may be called back. It has been reported that professionals stay current in their knowledge up to 10 years after leaving the industry, so there is indeed a very large pool of potential talent from which to draw. But it is costly to retain staff beyond retirement, and the costs and benefits must be carefully considered.

Geographic Intensity

Another option is to recruit in "nontraditional" geographical regions. China is now producing approximately 100,000 energy graduates a year. In Russia, the Moscow Institute of the Petrochemical and Gas Industry alone has an enrolment of 8,000 students and is adding 1,500 more each year.

There are growing pressures from the governments of many countries for international oil companies to play a more active role in expanding education and training opportunities. Resource-rich countries, particularly in the Middle East, increasingly expect international oil and gas companies to take part in developing the local workforce. Companies which recognize this as a major source of future talent will gain a competitive advantage. While many companies have a rather skeptical view of local content requirements, it is increasingly recognized that an effective strategy for meeting these requirements has several benefits, including the ability of companies to recruit more labor, develop good working relations with

local governments, and possess local knowledge, which is of crucial importance when building business sustainability and working with local subcontractors, unions, and community stakeholders. Another advantage is that a majority of the technical training in petroleum and other engineering disciplines can be provided in any part of the world and often at a much lower overall cost than in Europe or the US.

Some oil and gas companies have appointed regional recruitment directors and established policies to recruit in a wide geographical area, in particular in countries where they operate. There are, however, two important conditions to make these recommendations effective.

First, human resource planning has been, for many years, the stepchild of the oil and gas companies. Being a capital-intensive industry, the boards of most companies focus on investment planning, marketing strategies, and other key issues. Human resource planning is often relegated to the lower echelons in the hierarchy. This needs to change. Human resource planning needs to be upgraded to the board room. The proposals for avoiding future skills shortages are unlikely to be implemented successfully without the backing and support of the board room.

A second condition for these policies to work is to set up mechanisms facilitating collaboration and coordination among oil and gas companies. In the past, oil and gas companies have mostly responded individually, and without coordination, to skills shortages. But a strategy of "going it alone" is unlikely to produce optimal results. The impact will be larger if the industry takes joint action on any of these proposals.

There are many examples, from the past, of other industries facing serious challenges and deciding to join forces because the challenges are too big and individual responses not adequate. The prospects of yet another major skills shortage in the oil and gas sector is a challenge easier to meet when there is effective coordination and collaboration among companies. Joint action could start, for example, by establishing a mechanism to collect data from companies to produce an accurate forecast of aggregated global demand and supply of skills in the industry. A forum could also be established to exchange views, information, and decide where joint action is needed. **JPT**

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Case 2. An operator in South America had performed three bare-screen completions, in which fluid losses prevented the continuation of full circulation returns while displacing horizontal openhole pay sections to filtered completion brine. The best of the wells was producing 4,500 bbl of fluid per day. The underperformance was attributed to fluid losses and reduced circulation rates, leading to poor cleanout of openhole lateral pay intervals. Low-velocity rates would not remove drilling debris and drill-in fluid residue from the laterals. Under production, the debris plugged the sand screens.

On the fourth bare-screen completion, the operator and service company followed these steps:

1. Ran into the wellbore to depth in the lateral, circulating the open hole full with filtered completion brine; fluid losses were 40 bbl/hr (106 L/min).

2. Placed a 50-bbl carbonate pill in the lateral; fluid losses were reduced to 16 bbl/hr (42 L/min). This level of loss was still too high.

3. Ran a 35-bbl (one openhole volume) associative-polymer treatment; fluid losses decreased to 2 bbl/hr (2 L/min)

4. Circulated the well to filtered brine; FL was low enough to give static fluid conditions without measurable losses during screen-running operations.

Case 3. The service company was attempting to clean formation sand out of a well by means of a foamed-gel application. The sandstone formation was perforated from 5,820 to 5,380 ft, with BHT of 160°F and permeability of approximately 30 md. The goal was to clean the well from 5,820 ft down to a drillable bridge plug at 6,470 ft. When the cleanout work string was washed down to the perforated interval, circulation fell off dramatically. Service company operators increased foam quality and tried varying pumping techniques, but could not re-establish circulation. The operators then spotted two 10-bbl associative-polymer pills across the perforated interval and immediately regained 100% circulation. The cleanout was completed with no further circulation losses. The well resumed production without any problems observed, and production stabilized at a rate significantly higher than before the treatment.

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