



## The Big Crew Change: Turnover in the Oil Workforce

Posted by [Rembrandt](#) on March 17, 2007 - 12:30pm in [The Oil Drum: Europe](#)

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The mainstay of the oil- and gas industry workforce will retire in the coming ten years. While there is a fair amount of thinking about how to fix this huge problem in the oil- and gas industry, this factor is being ignored in the energy scenarios of the [International Energy Agency](#) and [Energy Information Administration](#). This posts looks at the numbers and potential effect on oil production of the retirement in the oil-industry.

The retirement of the workforce in the industry is normally referred to as “the big crew change”. People in this sector normally retire at the age of 55. Since the average age of an employee working at a major oil company or service company is 46 to 49 years old, there will be a huge change in personnel in the coming ten years, hence the “*big crew change*”. This age distribution is a result of the oil crises in ‘70s and ‘80s as shown in chart 1 & 2 below. The rising oil price led to a significant increase in the inflow of petroleum geology students which waned as prices decreased.

Chart 1 - Petroleum Degrees Granted in the USA and Oil Price from 1972 to 2006

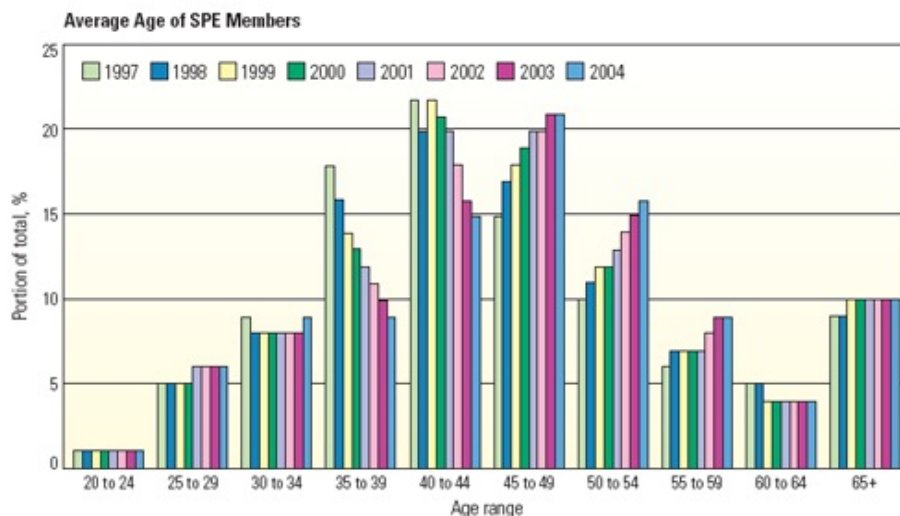


Chart 2 - Age distribution of Society of Petroleum Engineers (SPE) members from 1997 to 2004. The SPE is an international network of Petroleum Engineers with more than 60,000 members.

The problem has been aggravated due to the loss of in-house training programs in many large oil companies and the loss of research centres in many major oil companies. This was a response to the lower oil prices which caused overall contraction in the industry after the oil crises. The recent

fall in oil prices in 1998/1999 which bottomed at 12 dollars per barrel also prompted many companies to reduce or abandon drilling. Leading to the early retirement of thousands of thousands of workers at the end of the 20th century.

There are not enough new students to replenish the senior experts. This takes place in an age where incrementally more people are needed to supply an increasing number of oil to the world economy. The problem is accelerated because drilling is taking place in far more complex environments than before. The “*easy oil is gone*” as Shell and Chevron now commonly state in their PR campaigns. To learn the necessary competences to oversee project development in the industry one needs around 10 years of training in the various disciplines. According to management consulting firm Booz Allen Hamilton:

*“there are some 1,700 people studying petroleum engineering in 17 US universities compared with over 11,000 in 34 universities in 1993.”*

That the issue is not singled out to just North America has been quantified in a study by [Schlumberger Business Consulting: “Surviving the skills shortage”](#). This study published in 2006 has surveyed the worldwide workforce demand and supply in petrotechnical expertise (geologists, geophysicists and reservoir engineers) until 2016. They looked at 115 Universities which covers more than 70% of all relevant universities. The study found that annual deficits resulting from the balance between supply & demand of petrotechnical graduates over the coming decade exist in:

North America – annual shortage of 420;  
The Middle-East – annual shortage of 350;  
Russia – annual shortage of 160.

The study found that there is a surplus of petrotechnical personnel in:

China - annual excess of 410;  
Indonesia - annual excess of 900;  
India - annual excess of 100;  
Venezuela – annual excess of 500;  
Mexico – annual excess of 100.

The figures from Schlumberger are an average over the next ten years.

So on a net basis there is no shortage of workforce in itself, but on a regional basis in North America, the North Sea, The Middle East and Russia there is. Whether there will be sufficient transfer of personnel remains to be seen in the light of cultural barriers.

The bigger problem that comes to light from this study is the capability shortage. The most experienced geologists, geophysicist and petroleum engineers will retire. One study from the Society of Petroleum Engineers estimated that the cumulative experience loss will amount to 231,000 years. Schlumberger summarises this as:

*“There are insufficient personnel or ‘mid-carrers’ between 30 and 45 with the experience to make autonomous decisions on critical projects across the key areas of our business: exploration, development and production. This fact slows the potential for a safe increase in production considerably”*

The problem was recently addressed at the 15th Middle East Oil and Gas Show in Bahrain. Senior Vice President of Exploration and Production. [Abd Allah Al-Saif spoke about the capability shortage in Saudi-Arabia](#) telling the audience that:

*"Nearly half of our workforce [Saudi Aramco] is less than 30 years of age. Furthermore, surveys suggest that in the next few years more than 60 per cent of our engineers will have less than 10 years of experience."*

These problems cannot be solved on short notice and will have a serious effect on oil production. Companies look at partial solutions to the problem through drilling automation and knowledge transfer. Recently Schlumberger consulting and businesses wrote a report called: *"Changing the way we drill"* which talks about remote automated drilling from a distance, *"allowing operators to utilize their most qualified experts at any location to monitor drilling operations"*. Other consultants write about eLearning which leads to fast knowledge transfer: *"consisting of technology to capture knowledge via video (when people give presentations, for example) and then allowing fast and efficient search of this material from the vast repository of captured knowledge."*

Such problems may help but will hardly ameliorate the lack of years of experience. The [study from Booz Allen Hamilton](#) describes the issue and the partial solutions as follows:

*"Until now, companies have been able to work around the growing talent gap with increasing automation, process efficiencies and by turning to universities and outside service companies for incremental operating and project delivery capacity. But these adjustments alone are increasingly inadequate to make up for the growing shortage of skills and knowledge as activity levels rise and senior employees leave the industry. In many companies the 2007 planning cycle will likely show growing staffing and skills gaps opening up over the next 5 years."*

In essence, fewer oil fields can be developed because of this problem. Projects delays that are already quite common, as shown in chart 3 below, will become more widespread.

Chart 3 - Project delays as outlined in the February medium term oil outlook update of the International Energy Agency

The bad news is that this will lead to an earlier peak and subsequent sharper decline in the short term as less projects are developed. The good news is that more projects are left to develop, leading to a slower decline on the long term.



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