



José Sergio Gabrielli de Azevedo President, Petrobras

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How would you define the role of young people in the energy industry? What is the greatest contribution that the younger generation of today has to offer the industry of the future?

I see the impact of the younger generation on the industry in two ways: the first problematic, the second beneficial.

Firstly, the oil and gas industry is old, with a generation gap in almost all areas, so the transfer of knowledge and experience is always going to be problematic. Young professionals arrive with a different world view from that of the older generation. The young person arrives looking for challenges, wanting to do things and to apply the knowledge that he or she learned at university; the older one thinks he knows everything and doesn't acknowledge the contribution of the young person, which creates a problem, namely: how to manage the transfer of knowledge and speed up the training of younger people.

Secondly, young people arrive with a different set of values to those already in the industry, including a greater environmental and social conscience, introducing a series of new components into an industry traditionally associated with little concern for some of these issues.

These two elements will gradually be incorporated into the industry as the younger generation rise through the hierarchy to become managers and directors, thereby transforming it over time.

Why is it, do you think, that some good ideas from young people do not get the chance to penetrate the organisation of a company? How is your company structured to absorb and implement new ideas contributed by young professionals?

The energy industry is generally very procedurebased and therefore tends to be somewhat conservative. There isn't much innovation in



Elementary: Young professionals often have a greater capacity for 'thinking outside the box' than their senior colleagues

procedures and standards because they are already tried and tested and need to be followed in order to maintain operational discipline, which is paramount in this industry. Young professionals enter the industry highly motivated, with a basic knowledge of how the industry works but without the necessary experience to recognise smells, sounds, processes and the adrenalin that comes from hazardous situations.

On the other hand, that young person has a much greater capacity for giving quick answers, thinking 'outside the box' and coming up with ideas that are, in many cases, more productive.

At Petrobras, we mix teams from the older and younger generations together, so that on a day-today basis the best aspects of each can influence and complement the work of the other. In this way the end result is greater than the sum of its parts.

How were you able to make an impact as a young professional in your organisation?

I began my professional life at university, as a professor, so I have had a long relationship with young people, which I maintain to this day. If there is one thing you learn as a teacher it is that every year you receive an intake of the same age while you become increasingly older and more remote, so I tried to take that into consideration in my teaching, to encourage greater interaction in the classroom. But while the rebelliousness and indiscipline of youth can be a positive thing at university, in industry that indiscipline has to be reconciled with the operational structure and the company hierarchy. This was a shock to me as well, coming from a university structure, which is horizontal, to an industry which is vertically structured, as it has to be.

Young people are by nature rebellious and iconoclastic; they have ambitions and think they know everything. But the reality is that they are not as rebellious as they think they are, nor as iconoclastic as they imagine, so the industry has to combine these qualities in order to get the best out of them. In the last few decades, the oil industry has expanded massively, adding new technologies, countries and resources to the continuing challenge of extracting oil and bringing new products to market. Looking ahead, what do you think your generation has not achieved or could have done differently that should be the focus of the young professionals joining the industry today?

The oilfield worker of the past was a strong, courageous person – one might call him a 'rough neck' – who took too many risks and didn't give much thought to safety procedures. Today's operator uses a joystick, works with computerised controls, has to be careful with safety and needs to understand the processes he or she is controlling. Similarly, the geologist used to work with manual drawings, doing everything by hand, whereas now he or she has the benefit of virtual reality simulation, which requires a different skill set.

In the past, the industry depended on the sensorial experience of the professional. Today, he or she has the benefit of machines, software and advanced information capturing instruments. But the problem with these innovations is that they risk fetishising the technology, making people think that software and models offer the answer to everything, which is not necessarily the case. One also has to live through different situations in order to gain the analytical experience to correctly interpret all this information.

Today, we have better instruments but we run the risk of falling in love with the technology and forgetting that it is just a tool to help you interpret what you are doing. The young person has an aptitude for using the tools but the older person has the capacity to interpret the results.

There are things that the previous generation was not able to do because the necessary tools to accomplish them did not exist at that time, so the generation of today should not blame them for this.



Which young person that you have met has most impressed you, and why?

The decision-making process inside Petrobras is quite harsh on young people because most of the important decisions are taken by senior management, who are all senior professionals and who have only minimal contact with their younger colleagues. I try to have regular breakfast meetings with non-managerial workers, who are mostly young professionals and the impression I get from these meetings is that young people are extremely motivated and – contrary to what I expected – also have a high level of technical expertise.

I think the greatest challenge that we face is how to combine the values of our young professionals with those of the company – which prioritise career, the long term, professional development, relations with society and so on.

Some of the young people that have impressed me most include those involved in the WPC Youth Committee initiative and its Best Author competition, which reveals interesting talents. Here at Petrobras we have an Inventor's Award (coordinated by the company's research and development institute, CENPES), as well as programmes and meetings where young professionals get to present the results of their work, and these help us to identify and promote young talent. This is not always easy because the Petrobras qualification exam is heavily over-subscribed.

Young people, by nature, want immediate answers to the challenges they face and if they don't get these they can become frustrated and this can hide their true potential. We have noticed that there is a high departure rate among young professionals in their first four years at the company, after which period the turnover decreases rapidly.

The oil industry is widely perceived as an old and traditional industry, not only because of its long history but also because it demands such a long learning period to master as a subject. At the same time, we have seen in the recent past the blossoming of new industries that are more dynamic, with faster career trajectories, more appealing and with many big companies led by young professionals. How do view this discrepancy and do you think it is time for the oil industry to adapt to this new world order? If so, how should it do this?

The oil industry is extremely diverse. It is one thing to produce oil onshore in a frontier basin; it is quite another matter to produce onshore from a mature basin, and something else again to produce shale gas, oil sands, or heavy oil. All these examples, which are land-based production methods, are wellestablished, proven techniques, with relatively little need for technological innovation. It is a completely different discipline altogether to produce offshore, from deepwater fields. In this instance innovation is imperative, involving robotics and other cuttingedge technologies without which production at such immense depths and extreme pressures would be impossible. It also involves extremely rigorous procedures, as the stakes are much higher.

Petrobras is an offshore operator; technological challenges and innovation are absolutely fundamental to this company and very much present in our day-to-day activities. So, in our case I don't think we are associated with an old industry or one that is being left behind, but rather one that is constantly evolving through the development of advanced technologies.

Please, formulate one question that you would like to see answered by the youth.

I would like to put a question to the younger youth, the fully connected "Generation C" – the young person who lives on social networks, on wi-fi, who is constantly relating to different sources of information and segmenting his relationships of interest. And that question is: How can you combine that diversity and possibility of access with an industry that requires concentration, procedures and discipline?