

Guest Editorial*

"Petroleum Geoscience"

Editor's Note: *A new undergraduate programme has been introduced into the Faculty of Engineering entitled, "B.Sc. in Petroleum Geoscience - with Majors in Petroleum Geology and Petroleum Geophysics". Programme coordinators were invited to write a Guest Editorial outlining the need and salient features of the programme.*

The recent success and long-term growth potential of the gas business, particularly here in Trinidad and Tobago, has created a high demand for key technical/business skills and competencies. Unlike the oil booms of the 1960's, late 70's and mid 1980's, gas is a much different business with more inherent stability. Offshore development, production, and hydrocarbon exploitation activities just to meet the currently existing gas contracts in Trinidad and Tobago are forecasting staffing needs well beyond 20 years. If the industry's and government's plans for expansion of gas production from the contracted 2.5 bcf/g/d in 2003, to the expected contracts totalling over 5 bcf/g/d are realised, there will be a demand for these job skills for the next 50 years! This is a completely different scenario compared to the cyclic nature of the oil-based sector which is heavily dependent on the fluctuations of oil price.

Over the last four decades, there has been a steady loss of critical skills to the industry, usually with the older experienced personnel leaving before their skills have been properly 'handed down'. The largest skill gap for the upstream petroleum sector in Trinidad and Tobago is within the geosciences. Utilisation of advanced technologies in subsurface imaging such as 3D and 4C seismic is playing a critical role not only in the exploration of natural resources, but also in their development and production performance. Significant increases in ultimate reserve estimates and therefore, production and field life have been demonstrated repeatedly as these new technologies have been applied. This has led to an ever-increasing demand within the petroleum sector for these new technologies in order to remain economically competitive. Combined with the recent upswing in the price of oil, the global demand for Petroleum Geoscientists has increased significantly.

Petroleum Geoscience is concerned with understanding the structure of the earth to depth of around five miles to identify potential areas of hydrocarbon deposits and thence to identify in as much detail as is practicable the hydrocarbon bearing zones, fault patterns and water ingress. After a reservoir comes onto production, the Petroleum Geoscientists monitor production to ensure that forecasts are accurate and to help identify geological potential problems and opportunities. Petroleum Geoscientists are therefore the professionals that assess acreage, identify exploration prospects, suggest possible drilling sites for hydrocarbon exploration, appraise new discoveries, plan and implement field development, and monitor the wells during production, and generally assist field management by teaming with petrophysicists, drillers, engineers and commercial units.

The B.Sc. Petroleum Geoscience is a new 3-year programme that allows students the option of specialising in either Petroleum Geology or Petroleum Geophysics and has been a fast-track initiative within the Faculty of Engineering, Department of Chemical Engineering. The programme was brought on stream from conception in April 2001 to welcoming the first students in August 2001. The programme was asked for by the petroleum industry of Trinidad, particularly the GSTT (Geological Society of Trinidad and Tobago) and has support from all the major upstream hydrocarbon companies and government. It should be their main source of young graduate professional Petroleum Geoscientists in Trinidad. It is expected to be viable at 15 students/year for at least 20 years. The students will specialise in Petroleum Geology or Petroleum Geophysics in the 3rd year. The details are available from

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the Chemical Engineering Department. An M.Sc. programme is expected to commence within three (3) years.

The Faculty of Engineering has had extensive discussions with the major stakeholders involved in Trinidad's petroleum industry (bpIT, BG, Petrotrin, etc.), plus the GSTT (Geological Society of Trinidad and Tobago) and the Ministry of Energy and Energy Industries in planning of the programme and curricular discussed below. In fact, it is their specific desire to have educational training, particularly a Petroleum Geoscience programme, active in Trinidad that has been the force behind this proposal. This B.Sc. programme is tailored to satisfy the petroleum geoscience needs of the upstream petroleum industry and, in particular, that of Trinidad and Tobago.

The programme provides both a theoretical and practical approach to petroleum geoscience problems and has as its goal to improve the students' understanding of petroleum geoscience. Its objectives are:

- To train participants in petroleum geoscience for them to be prepared for work and fit for work.
- To promote a holistic approach to petroleum geology and petroleum geophysics through classwork, fieldwork and group projects relevant to the hydrocarbon provinces of Trinidad.

- To alert students to the modern computer software to assist them in their work.

A 3-year course delivers the essentials of the topic but a 4th year M.Sc. Petroleum Geoscience course of study would provide advanced training for students wishing to become professional Petroleum Geologists/Geophysicists or perhaps later, enter academic and ofcourse accreditation by professional bodies. The first two years of the Petroleum Geoscience course progressively build a broad, sound knowledge in relevant geology, mathematics, essential physical sciences, safety and environmental requirements and IT. The courses are integrated through a comprehensive and carefully designed fieldwork programme. At the end of the second year, students have a firm basis for selecting an option and can decide whether to follow the Petroleum Geology or Petroleum Geophysics option.

The academic quality control and educational standards will be set and monitored from within the Department. By running the programme within the Faculty of Engineering, the student is given an excellent opportunity for synergy between the Engineer and the Petroleum Geoscientist as will be practised in the professional world. The Petroleum Geoscience degree programme is expected to appeal especially to science-trained school students who have a fascination of the earth, but who wish to study for a potential industrial career - the Petroleum Geologist and the Petroleum Geophysicist. ■