Petroleum in our society – an overview

We have all come to appreciate energy as the prime mover of our economy, but beyond that, energy is an essential part of our daily life. At the flick of a switch, we have light; at the turn of an ignition key and a shift of a few levers, automobiles, trains, ships, airplanes transport us and our goods from one place to another. With the tap of a few keys, a doctor begins a laser surgical procedure, information from around the world is brought to the fingertips of a scientist, and the world is brought into our homes. These are only a few examples of our dependence on "external" energy, the prime mover behind all of these processes. It used to be said that to sustain life, only air, water, and food are needed. In our modern society, energy may well be the fourth realm of life sustainability. Our increasingly complex society with its developing industrial base has created a demand for energy that our forefathers could in no way have imagined. As the population grew and our society changed from an agrarian economy to one of industrialization, other basic energy sources were clearly needed. It was this need, then, which occasioned first the development of our coal resources and finally our deposits of crude oil and natural gas.

Our nation has, for more than half a century, relied upon two premium fossil fuels - oil and gas - to satisfy a wide range of energy needs. The oil and gas provide about two-thirds of this "external" energy consumed in the U.S. Natural gas' new abundance will change the U.S. and the world energy outlook. An expansion of the natural gas industry can provide both economic and security benefits for the world by generating jobs and meeting the demand of an energy-thirsty world. In other words, natural gas is expected to be the game-changer in the energy equation of the world during the 21st Century. In harmony with this, the industry has experienced a number of technological improvements, driven by the increasing global demand for crude oil and natural gas. There is no doubt that producing one barrel of oil and producing one cubic foot of natural gas, nowadays, require more engineering than ever. Improved methods of exploration, such as three dimensional seismic imaging, directional and horizontal drilling, completion engineering, and processing technologies have all dramatically improved both in terms advanced and environmentally benign implementation methodologies, thereby, intensifying the need for highly qualified technical specialists. In other words, the challenges and opportunities that come together with those challenges for petroleum and natural gas engineers are more than ever.