Shri Niladri Kumar Mitra

Shri Niladri Kumar Mitra *is director, Offshore, of Oil and Natural Gas Corporation in India. A petroleum engineering graduate from the Indian School of Mines, Mitra has been with ONGC for 35 years, serving in various technical, managerial, and administrative capacities. He is credited with helping bring new technologies to ONGC's offshore operations and helping reverse the production decline at Mumbai High, one of the biggest oil and gas fields in the region. Mitra is also on the board of a number of companies, including ONGC Videsh, Pawan Hans Helicopter India, Petronet LNG, Mangalore Refineries and Petrochemical, and ONGC Petro Additions.*

The overall theme for the 2008 SPE Indian Oil and Gas Technical Conference and Exhibition is "The Changing Landscape: Emerging Opportunities in the Indian E&P Industry." Can you explain the basic thinking and aims behind this theme choice?

The theme acknowledges India's growth in the oil exploration and production industry. There have been six rounds of successful bidding completed and the discovery of major gas fields on the east coast in Indian deep water. With only about 8 billion tonnes of oil equivalent being discovered out of a resource base of more than 30 billion tonnes of oil equivalent, ample opportunities exist for exploration by major oil companies in India.

India has a GDP growth rate of more than 9% and an industrial-production growth rate of 11%, and the primary energy requirement is likely to grow at a rate of more than 7%. At present, India is the fifth-largest energy consumer in the world and accounts for 4% of world energy consumption. But per capita consumption of energy in India is almost a third of the global average, which means that figure is likely to go up substantially with economic growth.

For sustained development, there is a need for continued supply sources, and the share of hydrocarbon resource base is expected to increase in the next 25 years. So there is tremendous opportunity for all players across the hydrocarbon value chain in the country.

As chairperson of the conference's technical committee, can you offer a few likely highlights of the event? In particular, can you discuss the opening plenary session and your hopes for what key issues you and the participants will discuss?

The conference program is set to attract industry leaders, professionals, and decision makers from all around the world with participation of major multinationals and national oil and gas companies and government officials. The first plenary session is on the theme of the conference and shall set the tone of the conference and include discussion of both technical and regulatory issues facing the global E&P industry. We expect participation from oilfield operators, service providers, government officials, and academicians to share their thoughts and vision on emerging opportunities within India's E&P sector.

What are other contemporary issues that will be discussed at the conference?

The second plenary session will be on exploration and development of deepwater fields in which the pioneering efforts of ONGC and Reliance Industries shall be showcased and the experience of major players operating in such water depths shall be shared. The major players in India's deep water include Petrobras, Shell, StatoilHydro, Chevron, and BP.

The Indian deepwater sector (which covers 1.34 million km^2) constitutes about one-third of the total basin area of the country, with potential resources of 10 billion tonnes.

There are 13 technical sessions planned over $2^1/_2$ days covering the complete gamut of the E&P sector, including reservoir management; brownfield development; deep water; improved and enhanced oil recovery; nonconventional resources; and a panel discussion on health, safety, and the environment.

What are the most pressing issues and technology challenges and gaps facing the industry, both onshore and offshore, in India and in the international E&P community. What are the potential solutions?

There are mainly two developmental aspects facing the E&P industry in India. First, production from existing fields is on the decline, and that will require

innovative technological solutions for the optimal exploitation of hydrocarbons. A second issue is the early monetization of hydrocarbon discoveries in deeper waters. There is an old saying that the new oil in mature fields can be found only through a novel idea, whereas the exploitation of new fields can be sparked off with available technologies. The deliberations of this conference are expected to address both. I am sure the deliberations, especially through the question-and-answer sessions, will satisfy the technical hunger of the participants.

Are there any new or emerging technologies or processes that you believe could enable the industry to make a step change in its performance? Any "blue sky" concepts that you believe hold the greatest realistic potential?
The present rate of global recovery is in the range of 35 to 40% on average, which implies that the bulk of hydrocarbons are still to be recovered. To recover these hydrocarbons, I believe that advances in seismic services, enhanced oil recovery/improved oil recovery, and better reservoir-modeling techniques will help in optimizing well performance. Those things could make a step change in performance. But the development of oil sands and gas hydrates may hold the greatest realistic potential.

India's deepwater sector has become a global hot spot over the past few years but is still in its infancy, with large portions unexplored. What opportunities do you see for companies such as ONGC and Reliance in developing their in-house technological capabilities for this? What can be done to further increase deepwater E&P activity and attract more international majors and independents?
Deep water is a high-investment and high-risk game but with the potential of high rewards. The three major sectors of India's deepwater basins include Kori-Comorin deep offshore; 85 Eastern deep offshore; and the Narcodam, or Andaman, deep offshore. ONGC today holds 35 exploration licenses in the deepwater sector: 28 blocks off the east coast and seven off the west coast. Sagar Samriddhi, the single biggest deepwater exploration campaign ever undertaken, was launched by ONGC in August 2003. It has propelled ONGC into the big league of deepwater operations. ONGC has drilled 41 deep/ultradeepwater wells, including 17 wells along the east coast. Well No. K-1, with a drilled depth of 7094 m, is the deepest well so far drilled in India, and that was by ONGC.

Some of the major milestones that have been achieved include three exploration wells in riserless mode and the first open-water wireline logging in water depth of 3008 m. Some of the challenges include drilling, well control, well completions and evacuation including flow-assurance issues, all of which provide huge opportunities for major international players.

(Continued on page 105)

What are the key opportunities and challenges faced by the industry when tackling brownfield developments in India? What role can contractors play in maximizing returns from such developments?
In India, most of the producing fields are at a mature stage of production and provide ample opportunities for enhancing recovery. At present, the average recovery factor is around 30%, whereas the global average is more than 45%. In Norway, it has reached a level of more than 60% with the application of new technologies. In view of bringing ONGC's global recovery factor at a par with international levels, ONGC has entered a memorandum of understanding with some Norwegian companies to stretch recovery from the current 30% at Mumbai offshore.

Contractors and service providers have a major role to play in India in providing the latest technologies to enhance production and recovery from mature fields. The first phase of redevelopment of Mumbai High has started paying rich dividends. Accordingly, ONGC has made huge investments and development plans for its offshore assets. In all such plans, better reservoir characterization, proper well placement, and real-time monitoring are the key parameters for exploiting the bypassed oil.

What are your views on how best to encourage the technology transfer and knowledge exchange between Indian and international companies?
In the recent past, ONGC has hired experts in different key areas of E&P, including waterflood management, reservoir management, reservoir simulation, well completion, produced-water treatment, and rotary-equipment management. These experts have provided much insight into the technology gaps that need to be bridged. This conference will provide a suitable platform for further strengthening the technology transfer with international oil majors and service providers.

What role do you see ONGC playing in the exploration and development of India's offshore sector over the next decade?
ONGC will continue to play a dominant and pioneering role in ensuring India's energy security. The huge investment in the current 5-year plan is a testimony to the efforts and commitment of ONGC for early monetization of new and marginal fields besides redevelopment of its mature assets for enhancing recovery. On the exploration front, ONGC intends to put more vigorous effort into developing existing blocks as well as acquiring more blocks in future bidding rounds. Ultradeepwater discoveries are being developed through collaborations with experienced oil companies such as StatoilHydro, Petrobras, Chevron, and others. Through its subsidiary, ONGC Videsh, ONGC is on a spree in acquiring oil equities abroad to supplement domestic production.

What must the oil and gas industry in India and elsewhere do to ensure that the right individuals are attracted to the industry and retained? Is the flow of young students entering India's academic system aware of the opportunities for them in the oil and gas industry, and how well do you think this industry does in attracting this young talent?
With globalization and economic development, retaining human capital in any industry is a challenge for organizations worldwide. The oil industry has also started facing the high attrition rate. In the past, when the oil price was very low, most of the fields became economically unviable for development, and accordingly, this has resulted in an aging workforce. The oil price nearing USD 100/bbl has rejuvenated the E&P industry by making many fields viable, and so massive investments are being planned.

To sustain this growth, the industry needs to attract talented and experienced manpower. To attract young professionals, this industry now offers technological opportunities to quench the thirst of those challenged by the information-technology industry during the previous decade. Still, E&P companies need to advertise and attract talent by highlighting the prospects offered by the industry, including the extraordinary challenges and enormous job satisfaction. With the demand for specialized courses in petroleum engineering, the industry needs to more aggressively pursue industry/institute cooperation. **JPT**

First SPE India Conference Examines E&P Opportunities

India's rise as an emerging E&P hot spot is drawing many industry players, from both the region and internationally, to SPE's inaugural Indian Oil and Gas Technical Conference and Exhibition.

The event will be held in Mumbai during 4–6 March 2008 at Mumbai's Bandra Kurla Complex and is organized by SPE and Reed Exhibitions. N.K. Mitra is chairperson of the conference Technical Program Committee, which has lined up a series of presentations under the conference's overall theme of "The Changing Landscape: Emerging Opportunities in the Indian E&P Industry." The event will feature a plenary session analyzing India's emerging E&P opportunities as well as technical sessions on brownfield development, reservoir management, drilling, deepwater E&P, improved and enhanced oil recovery, training, and nonconventional resources. Also on the Technical Program Committee are representatives from ONGC, Reliance Industries, BP, Chevron, Shell, ExxonMobil, Oil India, Cairn Energy, Halliburton, Schlumberger, Weatherford, and Baker Hughes.

India is the fourth-largest economy in the world and the third-largest consumer in Asia but currently imports the vast majority of its oil and gas. Its policy to increase domestic reserves and production has already begun to pay dividends, with large gas finds having been made in the deep waters off India's east coast and onshore Rajasthan. The country remains largely unexplored, with a well density of 20 per 100 km^2. Of the 26 sedimentary basins, only eight have been explored so far. The level of international interest recently prompted India to offer its largest amount of acreage ever in its latest bidding round.

The country's predicted hydrocarbon resources are estimated at 29 billion tonnes of oil equivalent, of which 10 billion are onshore, 12 billion offshore, and 7 billion in deep water.

For more information on the conference, please visit www.indianoilgas.org.